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2001 Summer Groundfish Survey update for selected Scotia-Fundy groundfish stocks.

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Abstract

A synopsis of the results of the 2001 summer bottom trawl survey on the Scotian Shelf and Bay of Fundy is provided. Survey trends for each stock from 1970 to present are shown as a series of histograms and expanding symbol maps. This information is used in assessment meetings as a key source of information on trends for selected groundfish stocks.

Résumé

Un résumé des résultats du relevé au chalut de fond qui a été effectué pendant l'été de 2001 dans les eaux du plateau néo-écossais et de la baie de Fundy est présenté. Les tendances pour chaque stock dans les relevés de 1970 jusqu'à aujourd'hi sont présentées sous forme d'une série d'histogrammes et de cartes de distribution. Ces résultats sont utilisés lors de réunions d'évaluation comme principale source d'information sur les tendances des stocks de poisson de fond sélectionnés.

Introduction

The annual groundfish bottom trawl survey was conducted by DFO on the Scotian Shelf and Bay of Fundy as planned from 3 July to 31 July 2001. The results of this survey were compiled for selected stocks to provide clients with a preliminary view of biomass, abundance, resource concentration, area occupied, size composition, and distribution as determined by the survey. The groundfish stocks covered by the report and the lead scientific investigator are listed in Table 1. The distribution of sampling effort compared with the past three years is shown in Figures 1 to 4. Survey trends for each stock from 1970 to present are shown in Figures 5 to 112. Mean weight and number caught per tow and long term frequency distribution histograms are not adjusted for the research vessel and survey gear changes which occurred in 1982-3. Fanning (1985) reported vessel conversion factors from comparative fishing experiments which are large for some species.

Branton and Black (1999, 2000) reported similar results for the 1999 and 2000 surveys. This document includes the resource concentration, prevalence, and CPUE where present indicators which measure demersal fish population distribution (Halliday, 2001). An estimate of resource concentration is calculated as the proportion of total survey area occupied by the top 75% of the total log(1 + catch) [sets grouped in 10 minute squares]. An estimate of resource prevalence is the proportion of sets containing the species of interest. This provides an indication of how widely the species is distributed within the survey area without reference to density. A third distribution index, CPUE where present, is the average of the log (non-zero catches) and is indicative of the average local density.

Comprehensive interpretations of stock status are contained in stock assessment documents prepared annually for many of the stocks described here (http://www.dfo-mpo.gc.ca/csas/). Such reports contain information on commercial fishery catch rates and other survey results when available. Therefore, the abundance trends reported here, based on the survey information only, are not directly comparable to those provided in recent assessments.

Survey Description

The 32nd annual Scotian Shelf groundfish survey was conducted from the research vessel CSS *Alfred Needler* out of the Bedford Institute of Oceanography, Dartmouth, N.S., on two trips N2001032 (3-15 July 2001) and N2001037 (18 July - 31 July 2001). The survey was conducted using the standard protocol (Koeller, 1981). Two hundred and seven fishing stations, from the Upper Bay of Fundy to the northern tip of Cape Breton and offshore to the 400 fathom contour, were completed.

Samples were obtained with a Western IIA bottom trawl towed for 30 minutes at a speed of 3.5 knots. The trawl has a 106 foot roller-rigged footrope and 2000 pound Portuguese doors. The codend is lined with 3/4 inch mesh to retain small fish. All finfish caught were sampled for length and weight and some species were sampled additionally for otoliths to determine age, for evidence of sexual maturity and for stomach contents.

Vertical profiles of temperature, salinity, nutrients and oxygen were observed at all fishing stations.

References

Branton, R. and J. Black. 1999. 1999 Summer Groundfish Survey update for selected Scotia-Fundy groundfish stocks. CSAS Res Doc. 99/151. 60p.

Branton, R. and G. Black. 2000. 2000 Summer Groundfish Survey update for selected Scotia-Fundy groundfish stocks. CSAS Res Doc. 2000/129. 61p.

Fanning, L.P. 1985. Intercalibration of research vessel survey results obtained by different vessels. CAFSAC Res. Doc. 85/3: 43p.

Halliday, R.G. 2001. Proceedings of the Fisheries Management Studies Working Group (15-16 and 31 May 2001). CSAS Proc. Ser. 2001/21. 82p.

Koeller, P. 1981. Manual for groundfish survey personnel - cruise preparation, conduct and standing orders. DFO Marine Fish Division Laboratory Reference No. 81/3.

Table 1. Stock name, figure list, page list, as well as name, telephone number and email address of the lead investigator for groundfish stocks observed on 2001 summer bottom trawl survey.

Stock	Figures	Pages	Investigator	Telephone	E-mail
4Vn Cod*	5 - 8	9-10	Mohn	(902) 426-4592	MohnR@mar.dfo-mpo.gc.ca
4VsW Cod*	9 - 12	11-12	Fanning	(902) 426-3190	FanningP@mar.dfo-mpo.gc.ca
4X Cod*	13 - 16	13-14	Clark	(506) 529-8854	ClarkD@mar.dfo-mpo.gc.ca
4VW Haddock*	17 - 20	15-16	Frank	(902) 426-3498	FrankK@mar.dfo-mpo.gc.ca
4X Haddock*	21 - 24	17-18	Hurley	(902) 426-3520	HurleyP@mar.dfo-mpo.gc.ca
4VWX Pollock*	25 - 28	19-20	Neilson	(506) 529-8854	NeilsonJ@mar.dfo-mpo.gc.ca
Unit 3 Redfish*	29 - 32	21-22	Branton	(902) 426-3537	BrantonB@mar.dfo-mpo.gc.ca
4VW Plaice*	33 - 36	23-24	Fowler	(902) 426-3316	FowlerM@mar.dfo-mpo.gc.ca
4VW Yellowtail*	37 - 40	25-26	Fowler	(902) 426-3316	FowlerM@mar.dfo-mpo.gc.ca
4VW Witch*	41 - 44	27-28	McRuer	(902) 426-3585	McRuerJ@mar.dfo-mpo.gc.ca
4VW Winter Flounder*	45 - 48	29-30	Stobo	(902) 426-3316	StoboW@mar.dfo-mpo.gc.ca
4X Plaice*	49 - 52	31-32	Fowler	(902) 426-3316	StoboW@mar.dfo-mpo.gc.ca
4X Yellowtail*	53 - 58	33-34	Fowler	(902) 426-3316	StoboW@mar.dfo-mpo.gc.ca
4X Witch*	57 - 60	35-36	McRuer	(902) 426-3585	McruerJ@mar.dfo-mpo.gc.ca
4X Winter Flounder*	61 - 64	37-38	Fowler	(902) 426-3316	FowlerM@mar.dfo-mpo.gc.ca
4VWX Halibut*	65 - 68	39-40	Zwanenburg	(902) 426-3310	ZwanenburgK@mar.dfo-mpo.gc.ca
4VWX Silver Hake*	69 - 72	41-42	Showell	(902) 426-3501	ShowellM@mar.dfo-mpo.gc.ca
4VsW Winter Skate*	73 - 76	43-44	Simon	(902) 426-4136	SimonJ@mar.dfo-mpo.gc.ca
4VWX Monkfish*	77 - 80	45-46	Beanlands	(902) 426-3515	BeanlandsD@mar.dfo-mpo.gc.ca
4VW White Hake*	81 - 84	47-48	Bundy	(902) 426-8353	BundyA@mar.dfo-mpo.gc.ca
4X White Hake*	85 - 88	49-50	Bundy	(902) 426-8353	BundyA@mar.dfo-mpo.gc.ca
4VWX Wolffish	89-92	51-52	McRuer	(902) 426-3310	McruerJ@mar.dfo-mpo.gc.ca
4VWX Cusk*	93-96	53-54	Comeau	(902) 426-4136	ComeauP@mar.dfo-mpo.gc.ca
4VW Lumpfish	97-100	55-56	Wilson	(902) 426-3318	WilsonS@mar.dfo-mpo.gc.ca
4X Lumpfish	101-104	57-58	Wilson	(902) 426-3318	WilsonS@mar.dfo-mpo.gc.ca

Stock	Figures	Pages	Investigator	Telephone	E-mail
4VW Turbot	105-108	59-60	Frank	(902) 426-3498	FrankK@mar.dfo-mpo.gc.ca
4VWX Spiny Dogfish	109-112	61-62	Hurlbut	(506) 851-6216	HurlbutT@dfo-mpo.gc.ca

* 2001 SSR exists

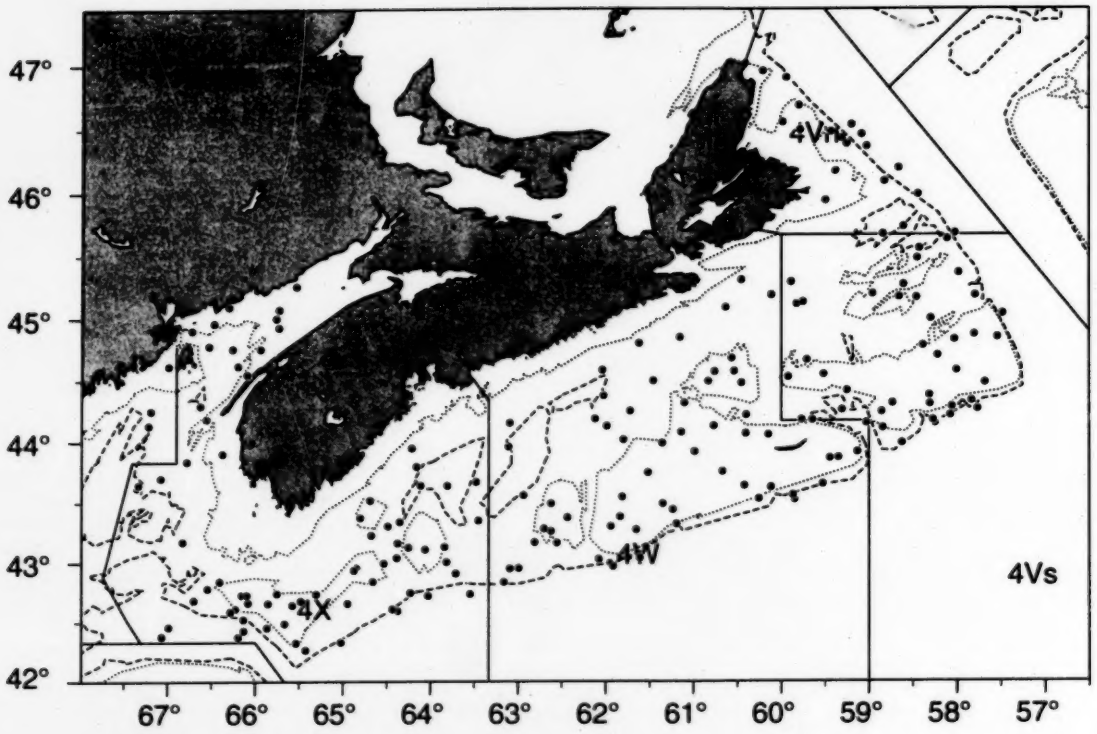
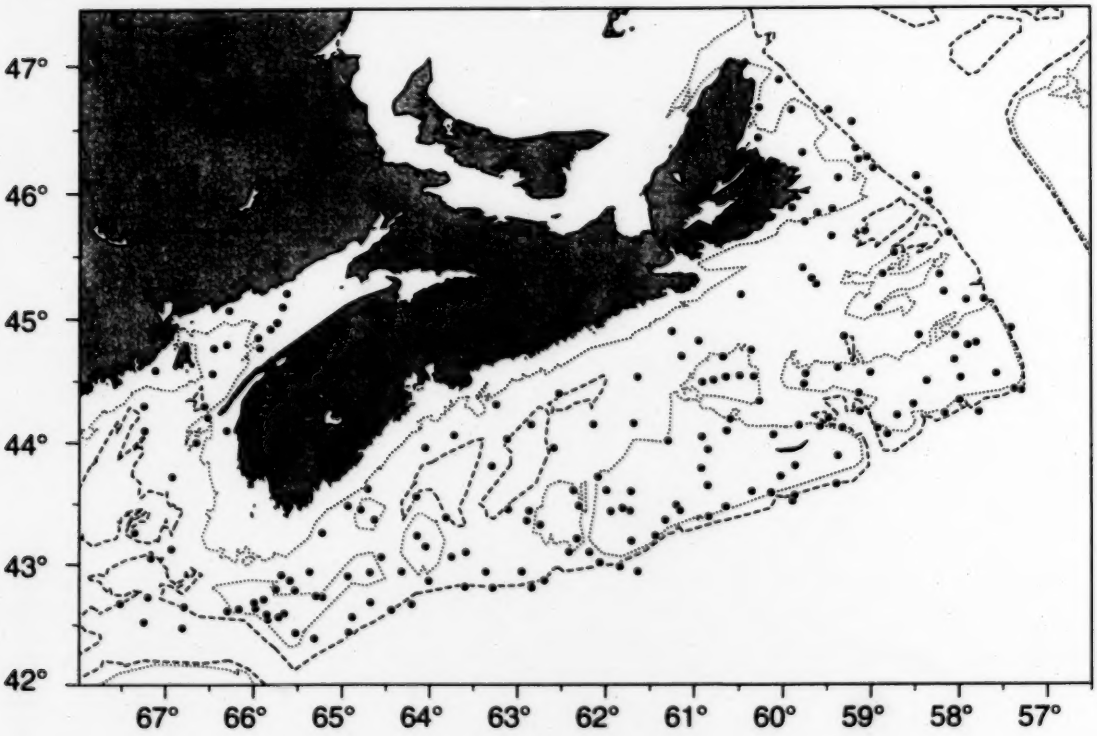


Fig. 1. Summer Groundfish Survey Positions 1998



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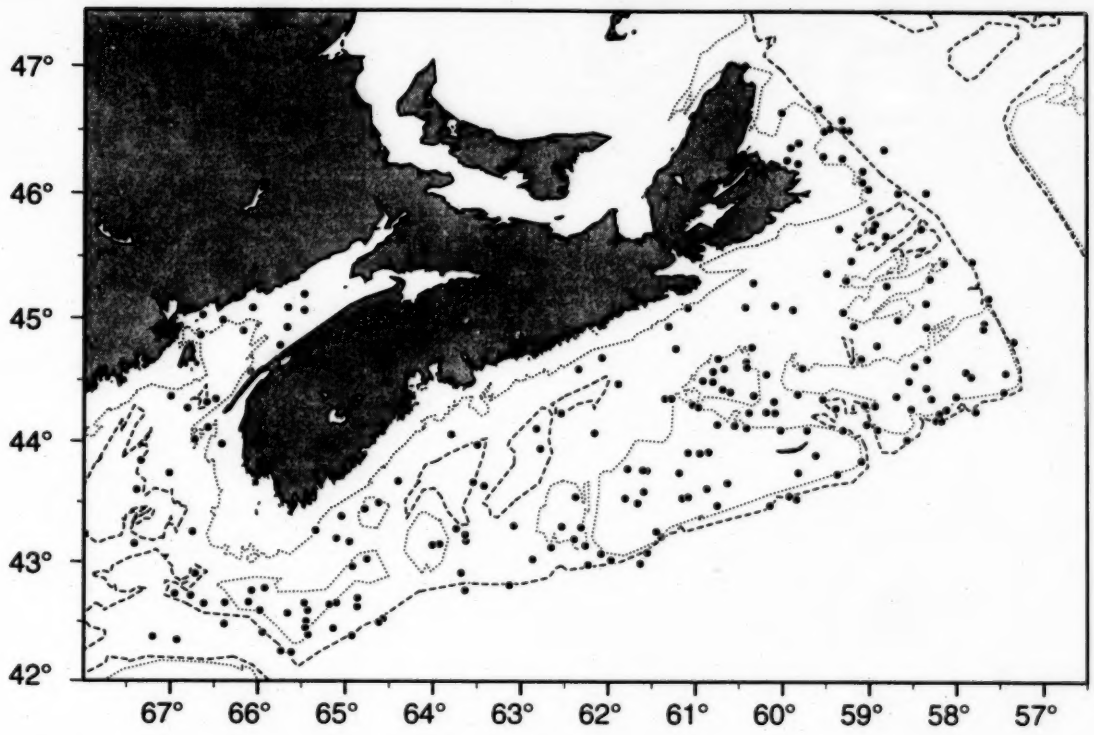

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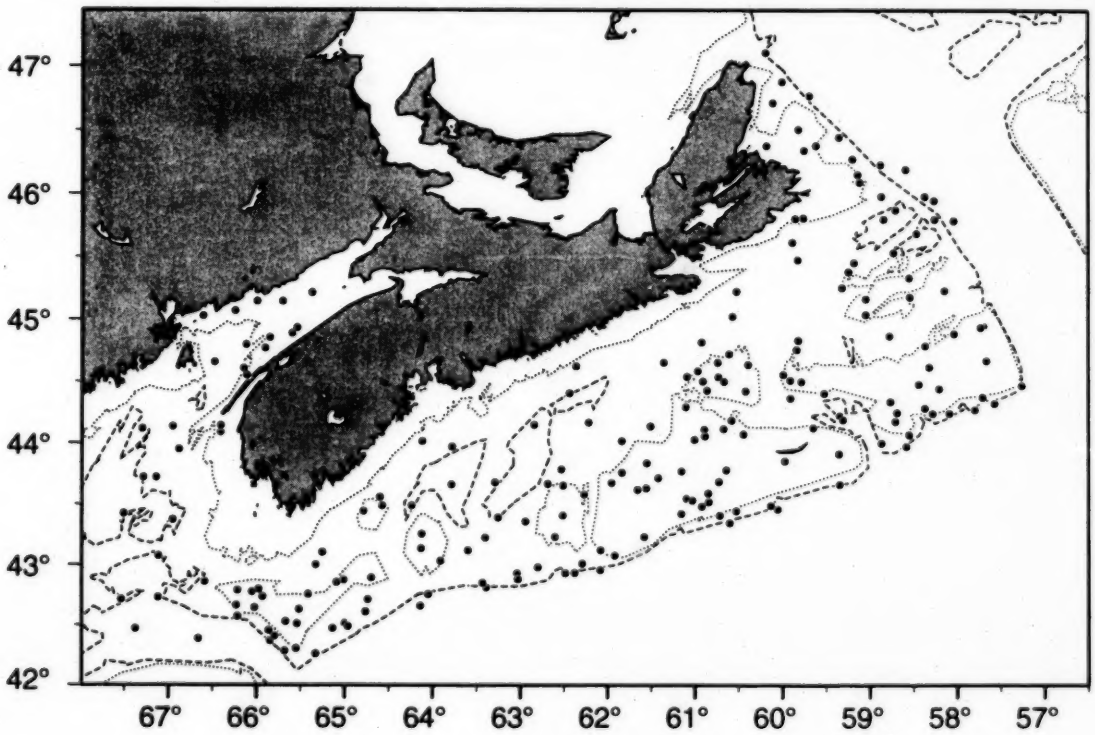

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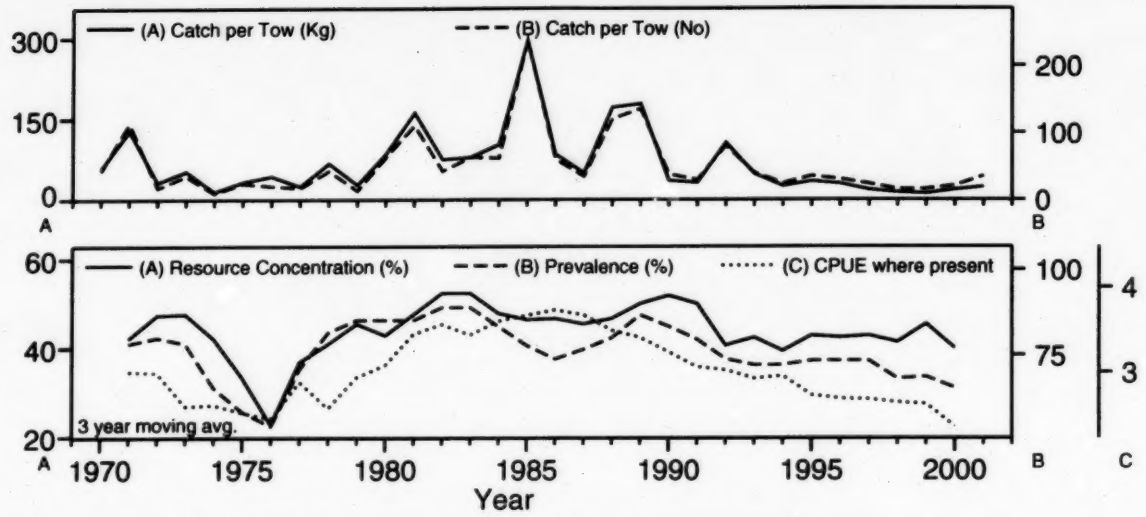

Fig. 5. 4Vn Cod stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

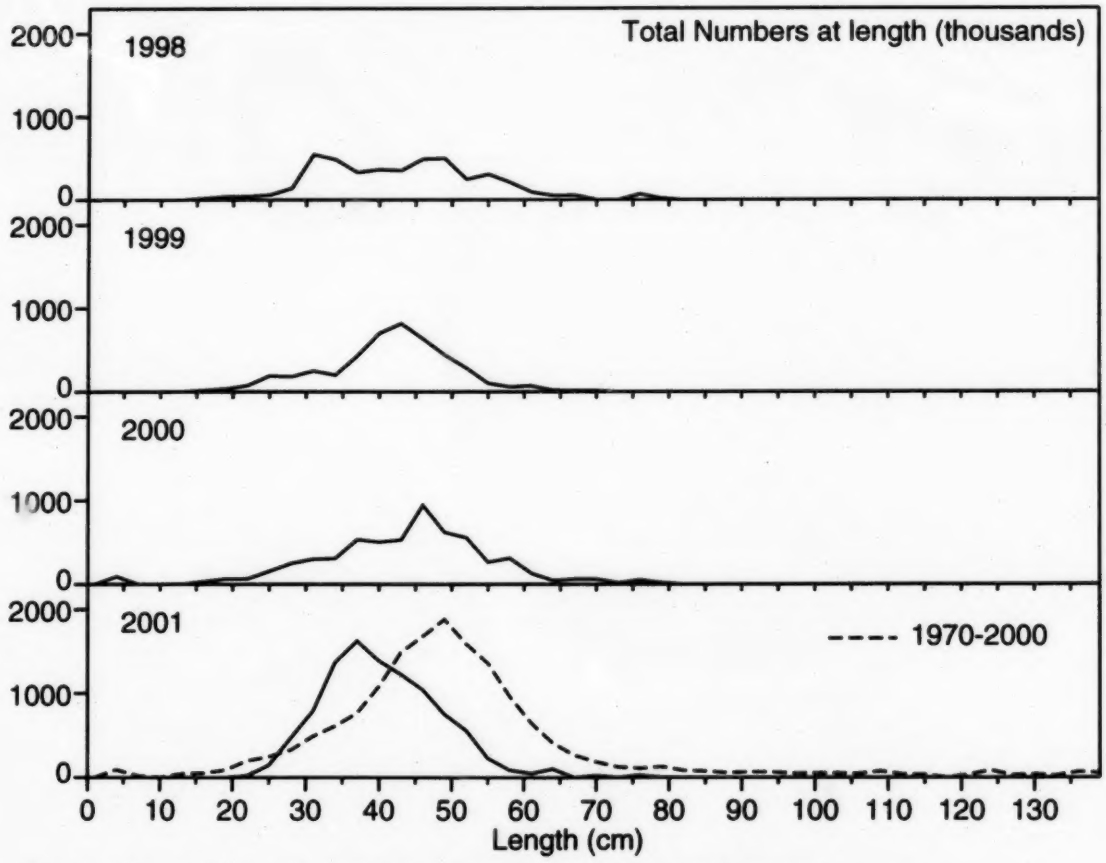

Fig. 6. 4Vn Cod length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

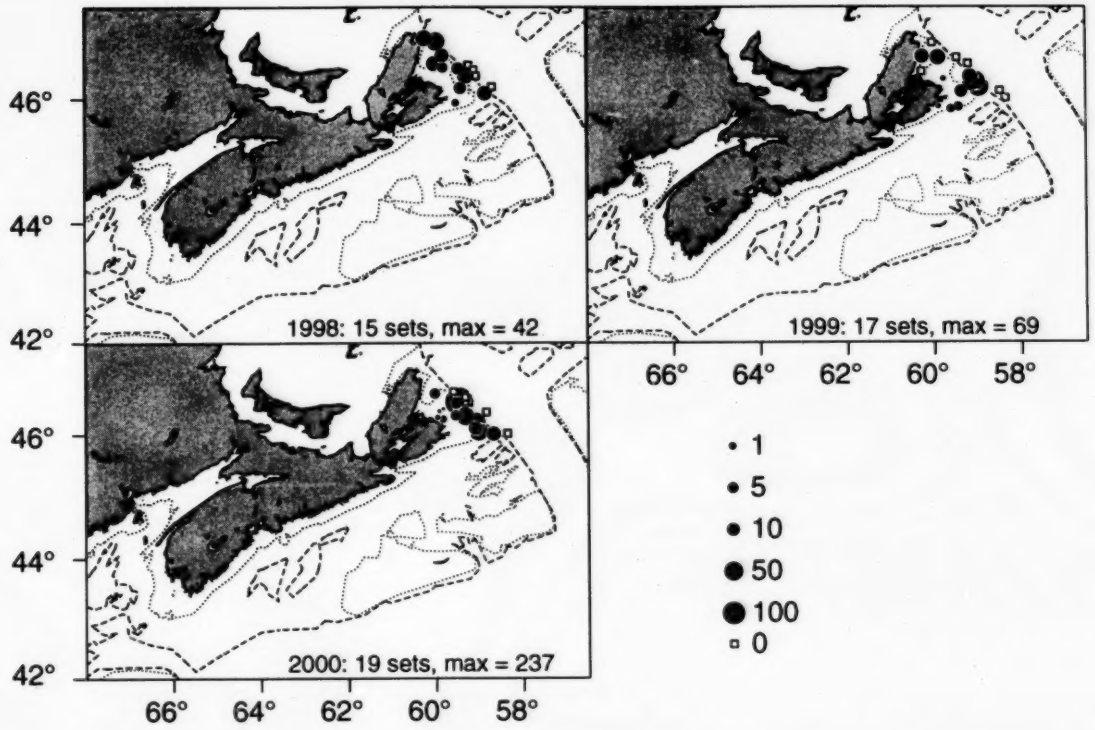

Fig. 7. 4Vn Cod Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

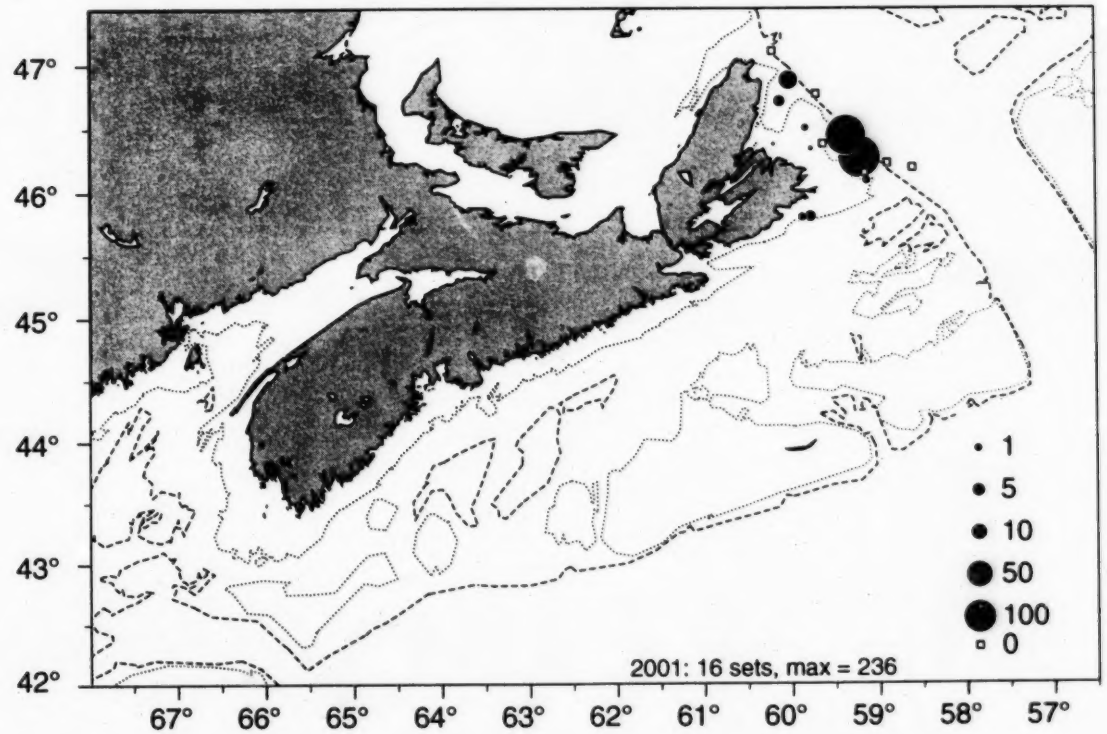

Fig. 8. 4Vn Cod Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

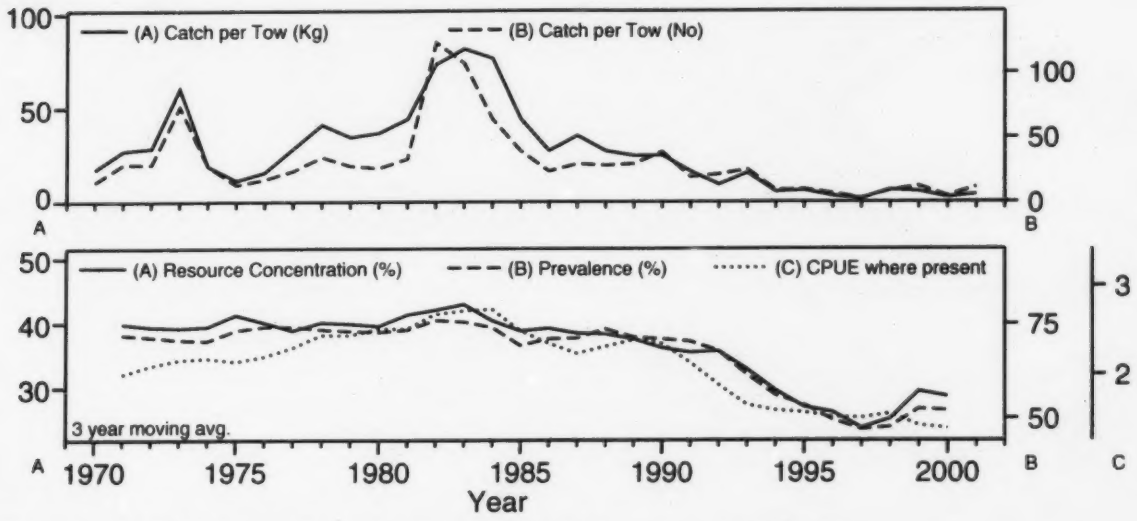

Fig. 9. 4VsW Cod stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

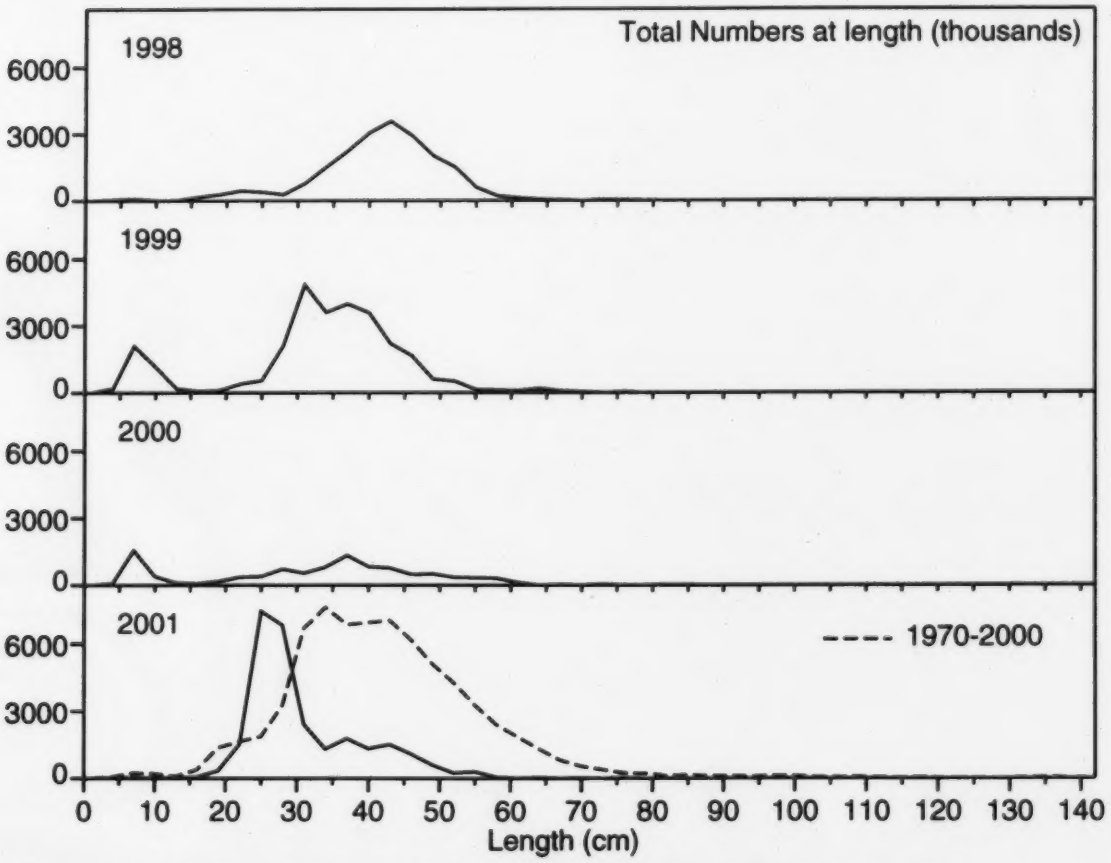

Fig. 10. 4VsW Cod length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

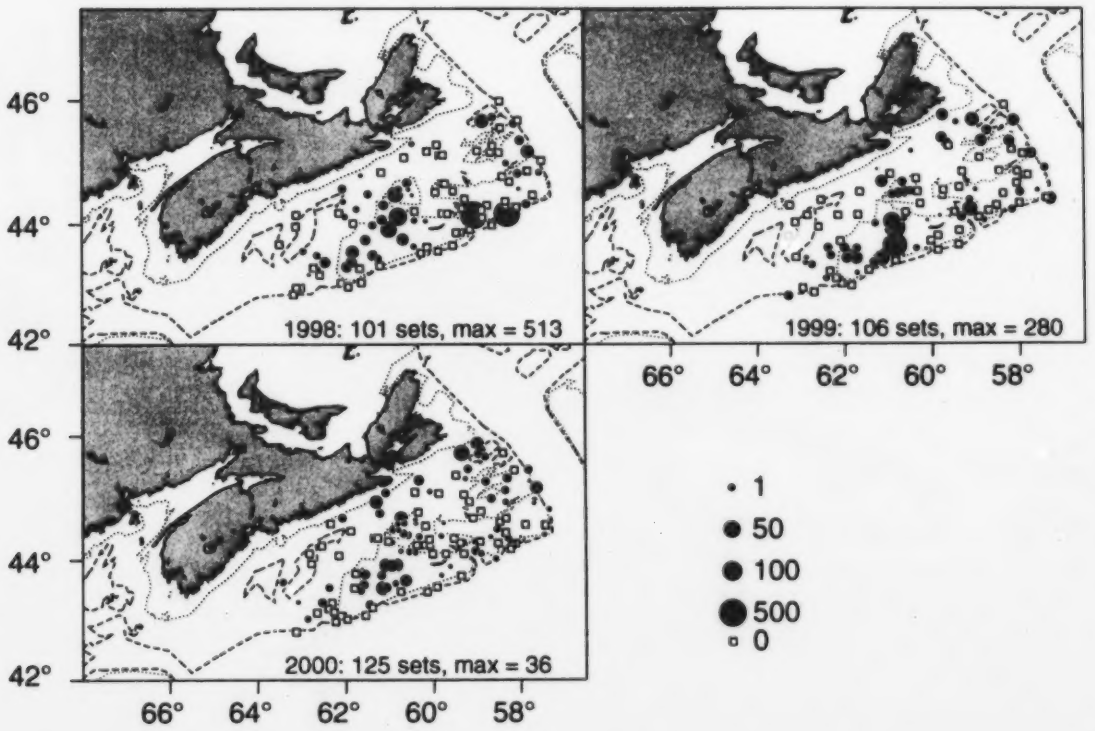

Fig. 11. 4VsW Cod Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

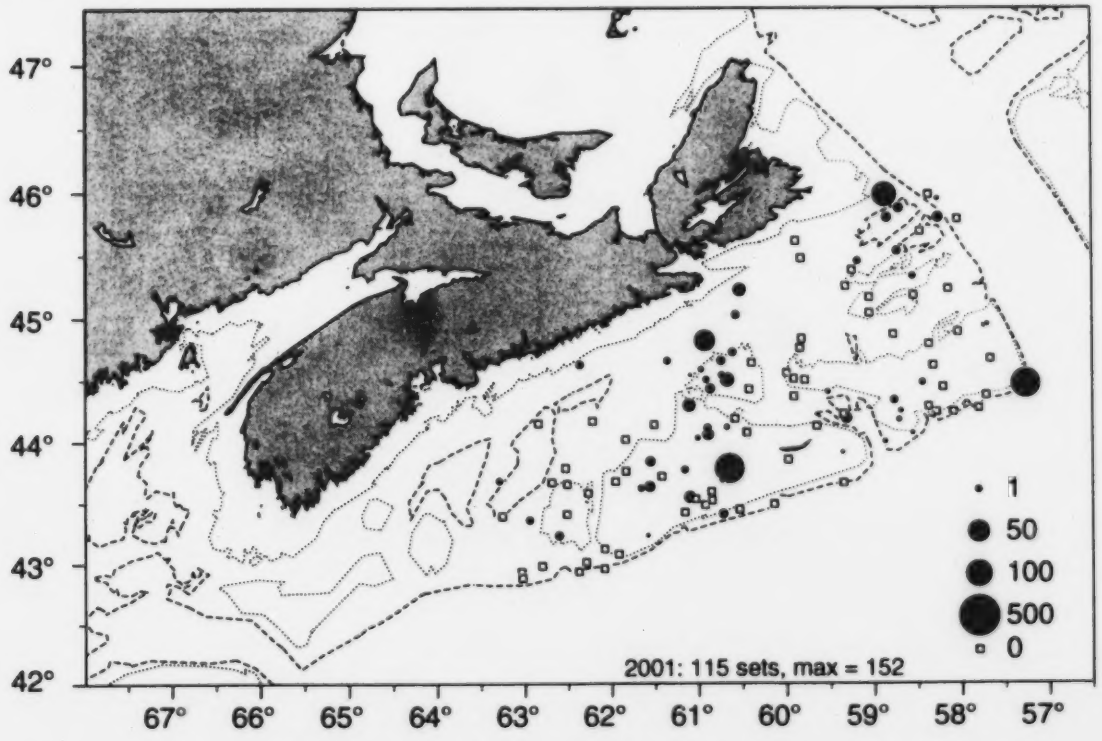

Fig. 12. 4VsW Cod Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

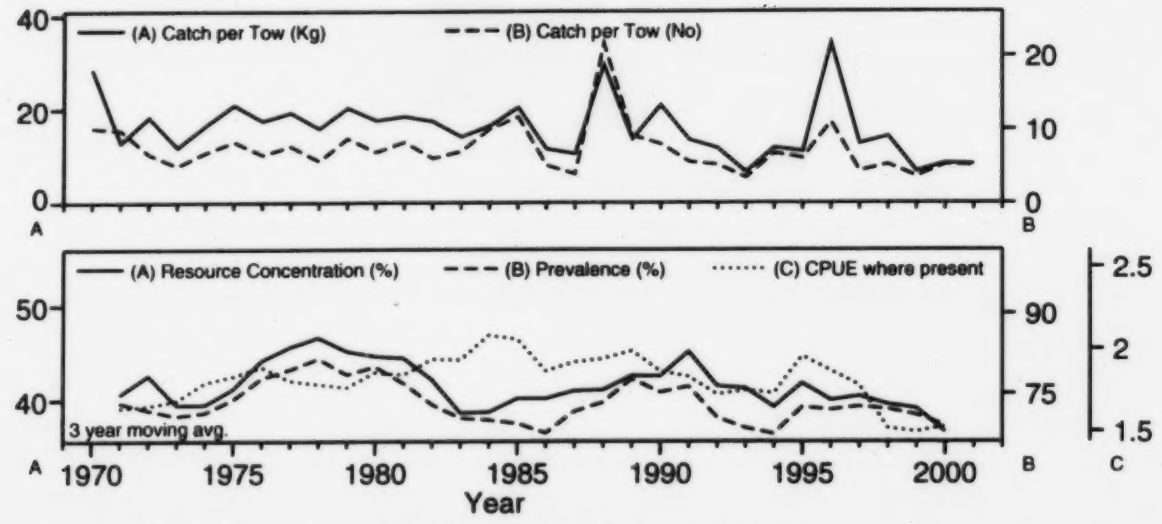

Fig. 13. 4X Cod stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

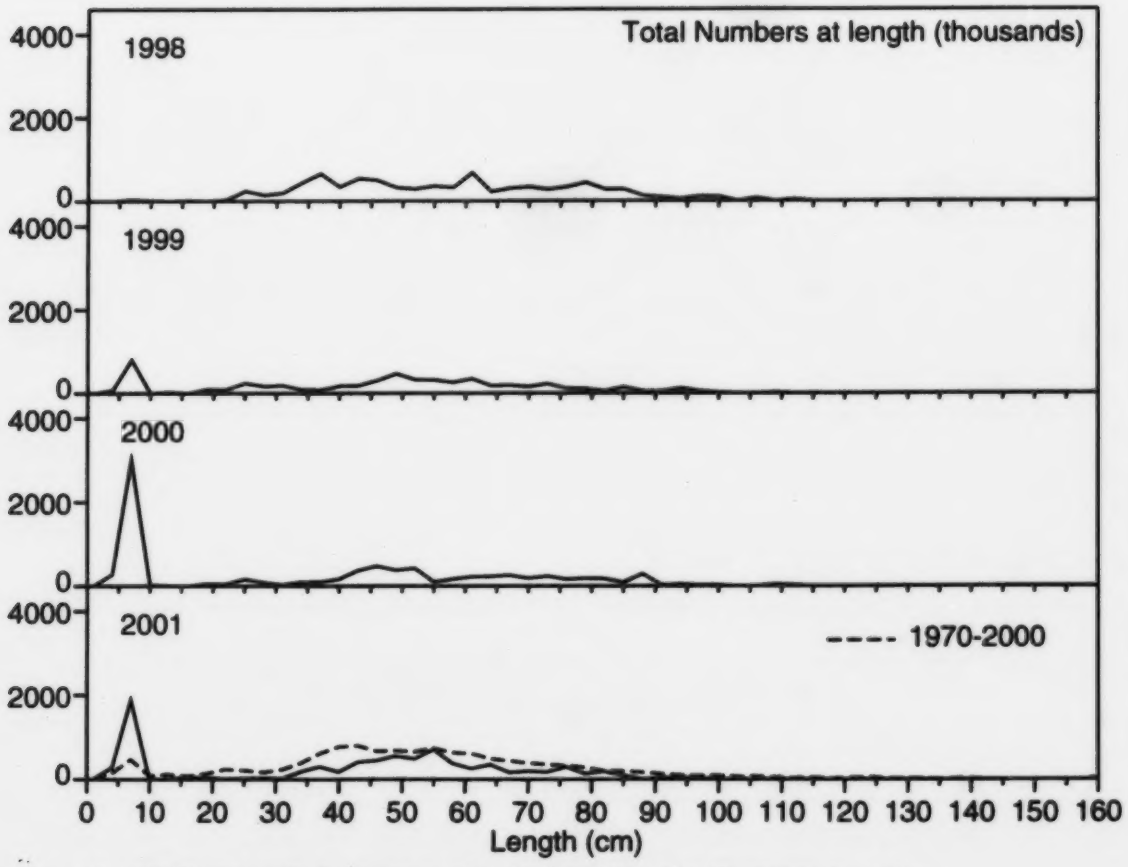

Fig. 14. 4X Cod length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

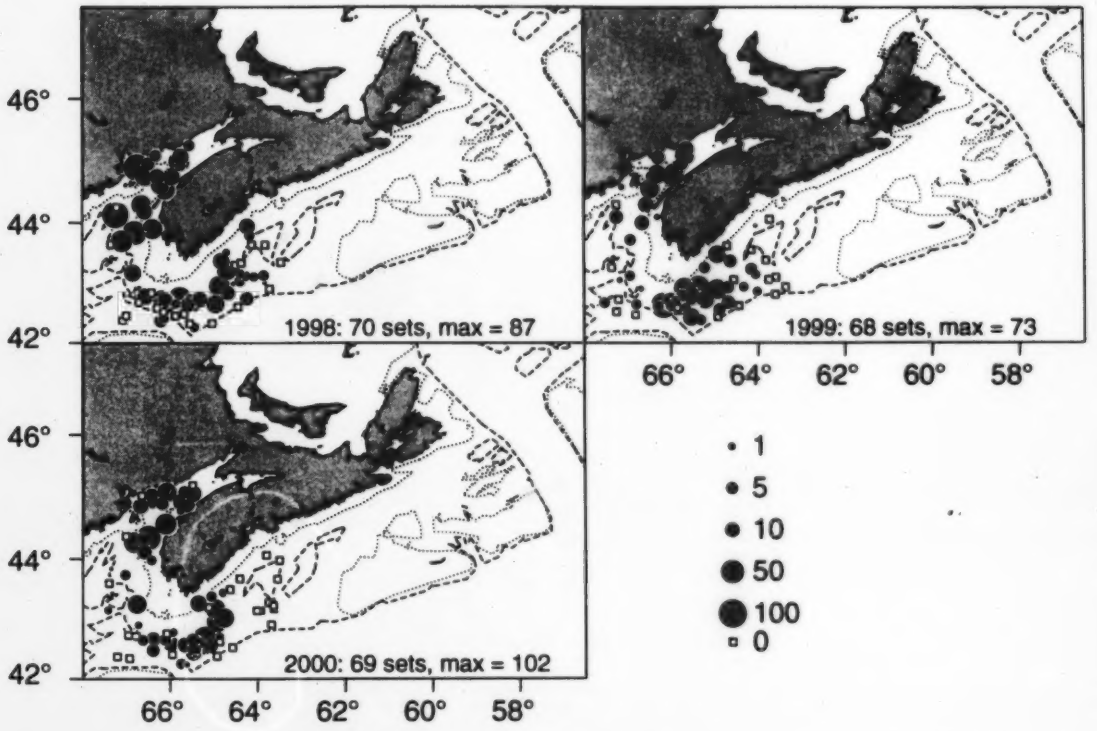

Fig. 15. 4X Cod Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

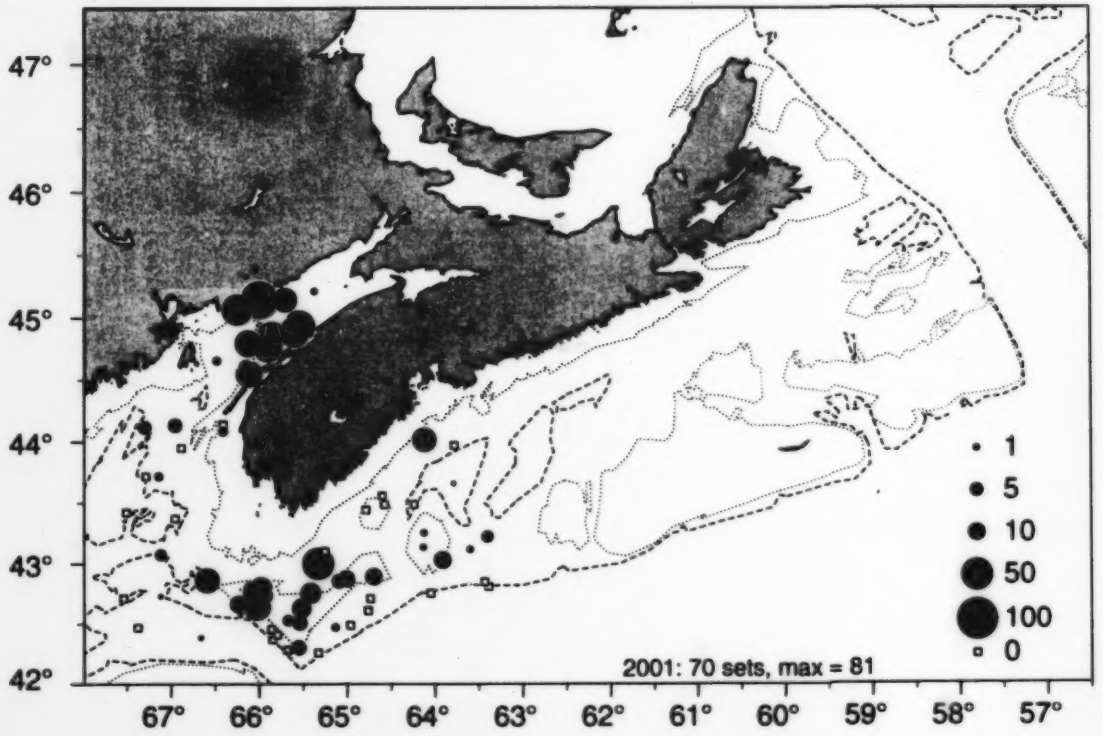

Fig. 16. 4X Cod Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

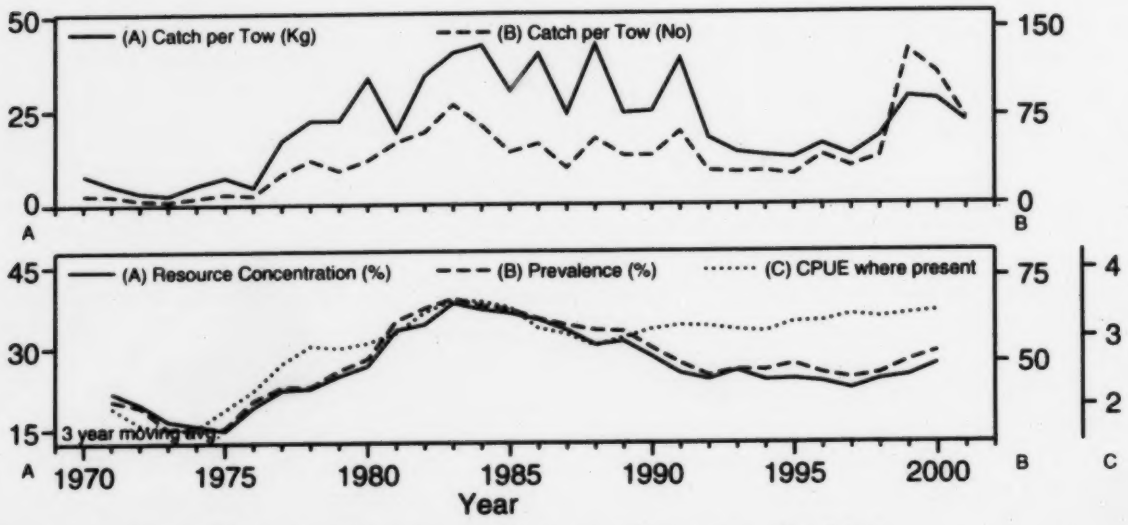

Fig. 17. 4VW Haddock stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

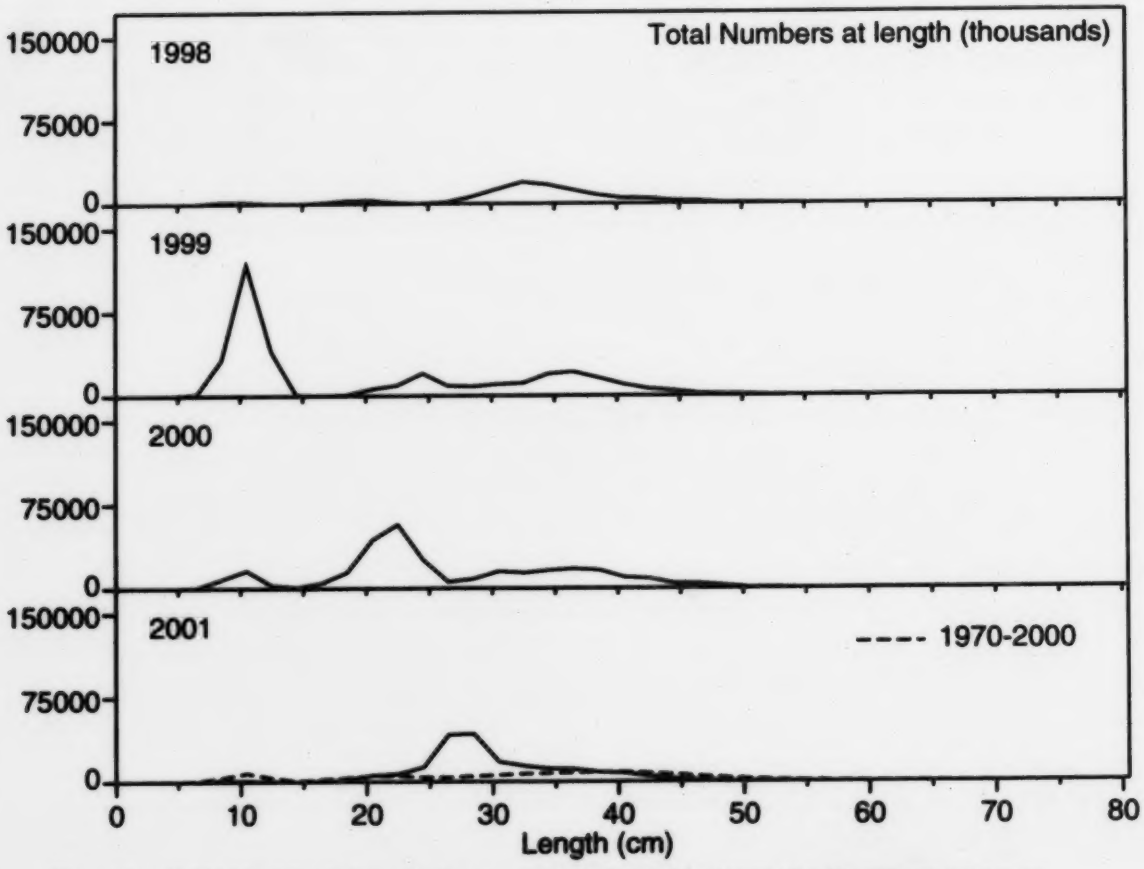

Fig. 18. 4VW Haddock length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

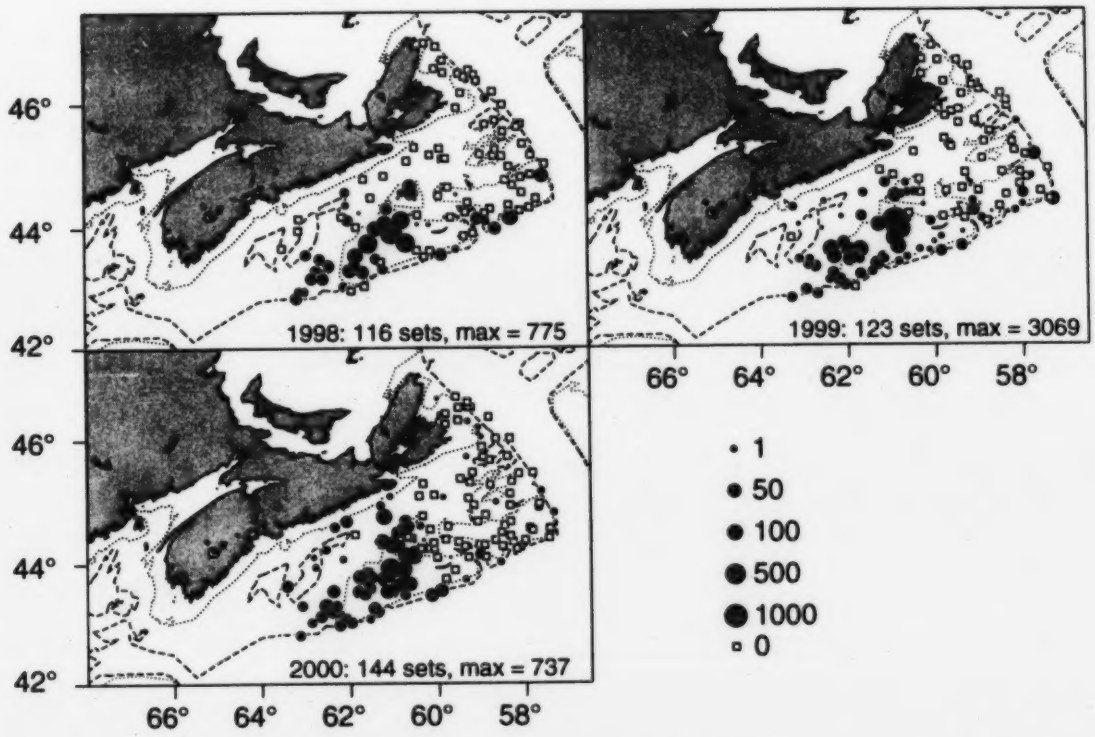

Fig. 19. 4VW Haddock Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

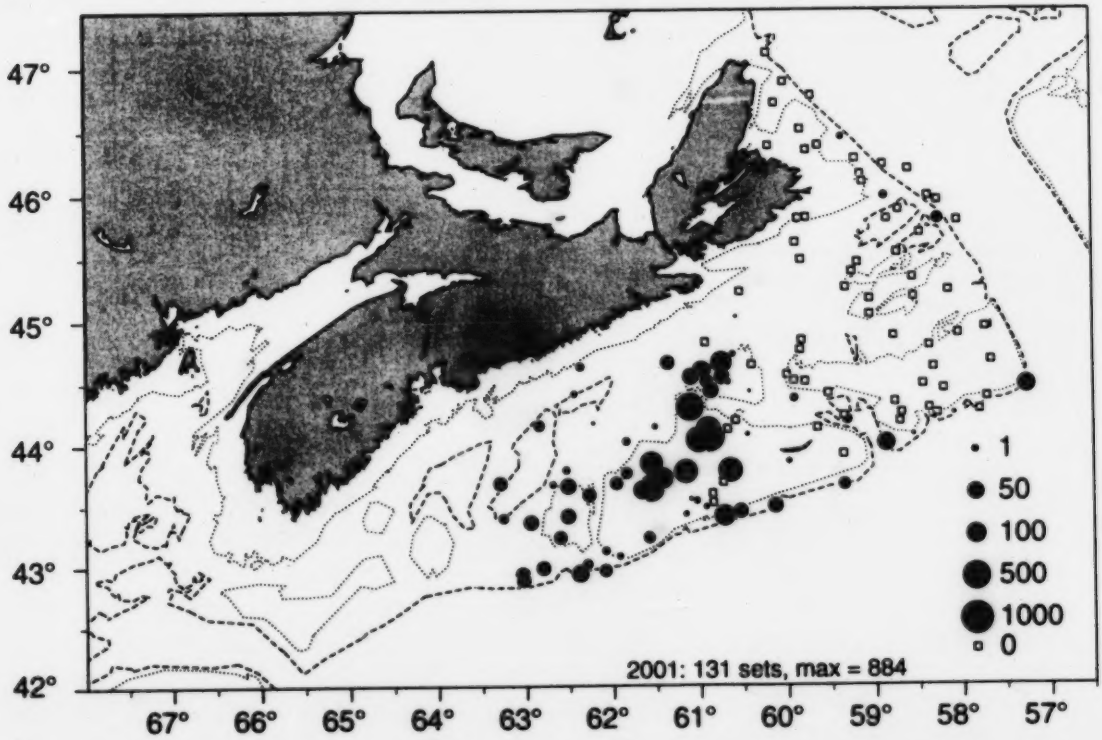

Fig. 20. 4VW Haddock Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

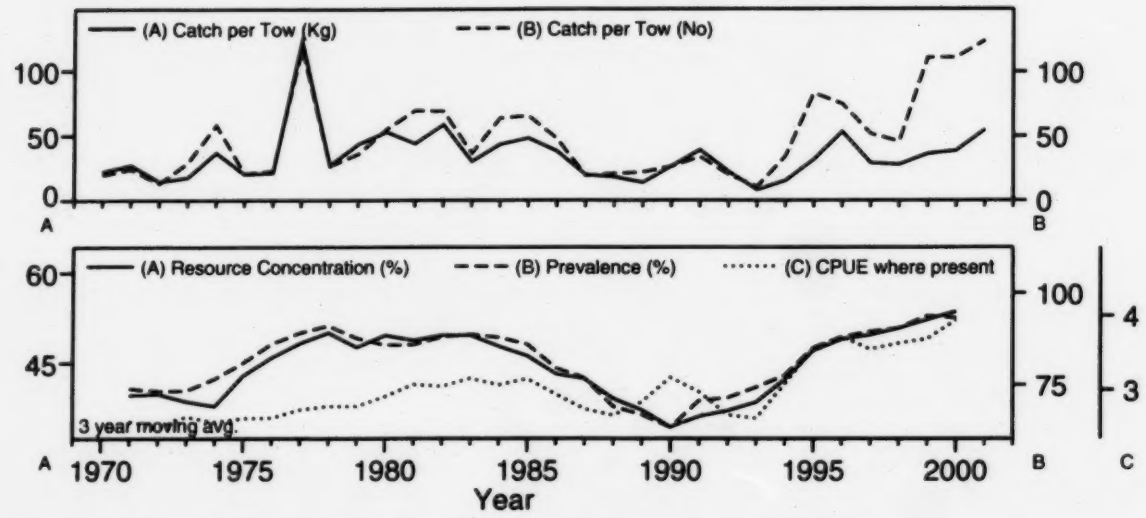

Fig. 21. 4X Haddock stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

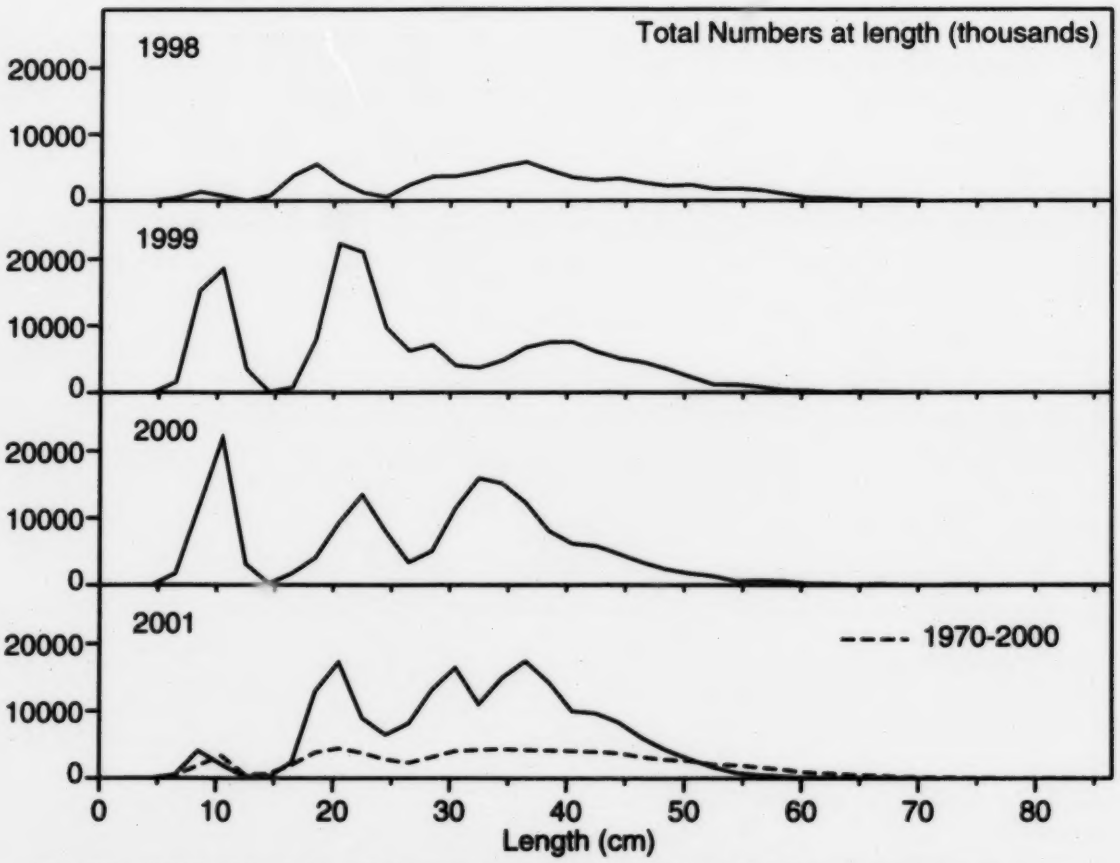

Fig. 22. 4X Haddock length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

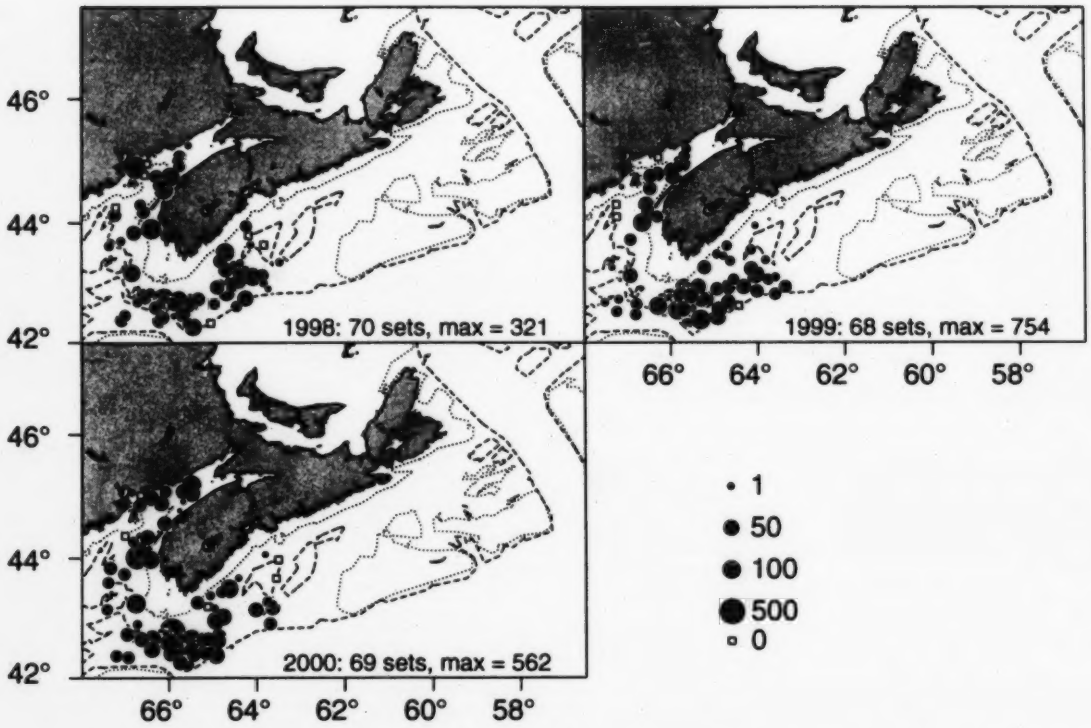

Fig. 23. 4X Haddock Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

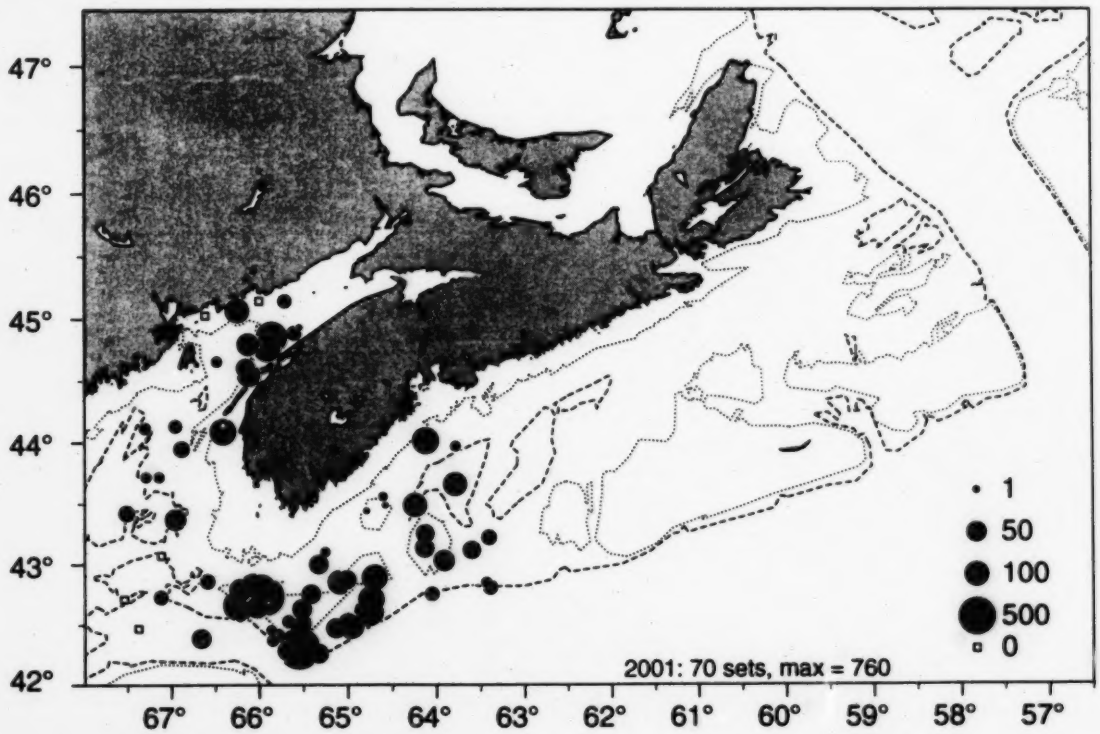

Fig. 24. 4X Haddock Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

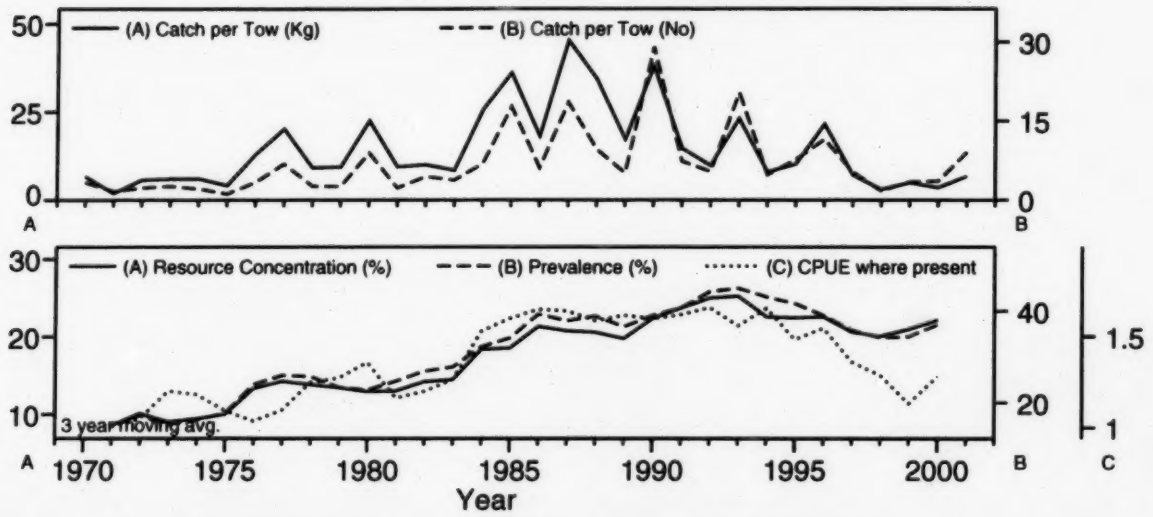

Fig. 25. 4VWX Pollock stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

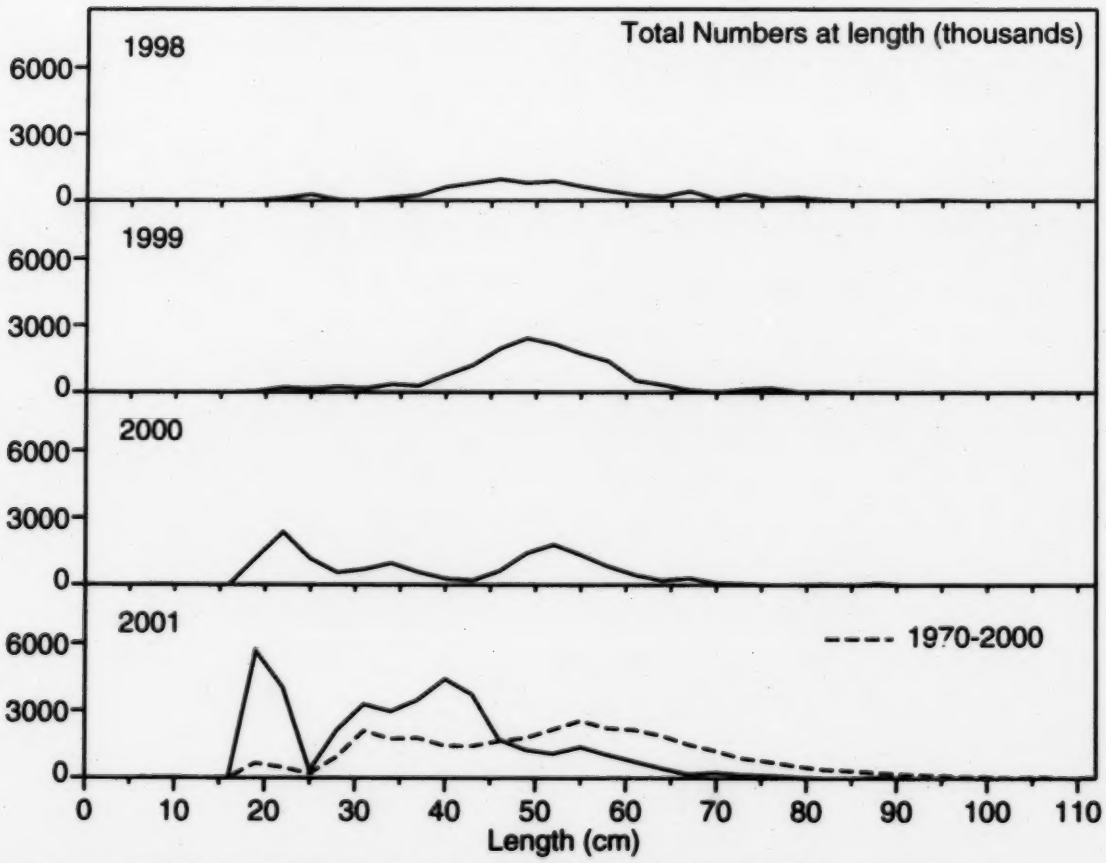

Fig. 26. 4VWX Pollock length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

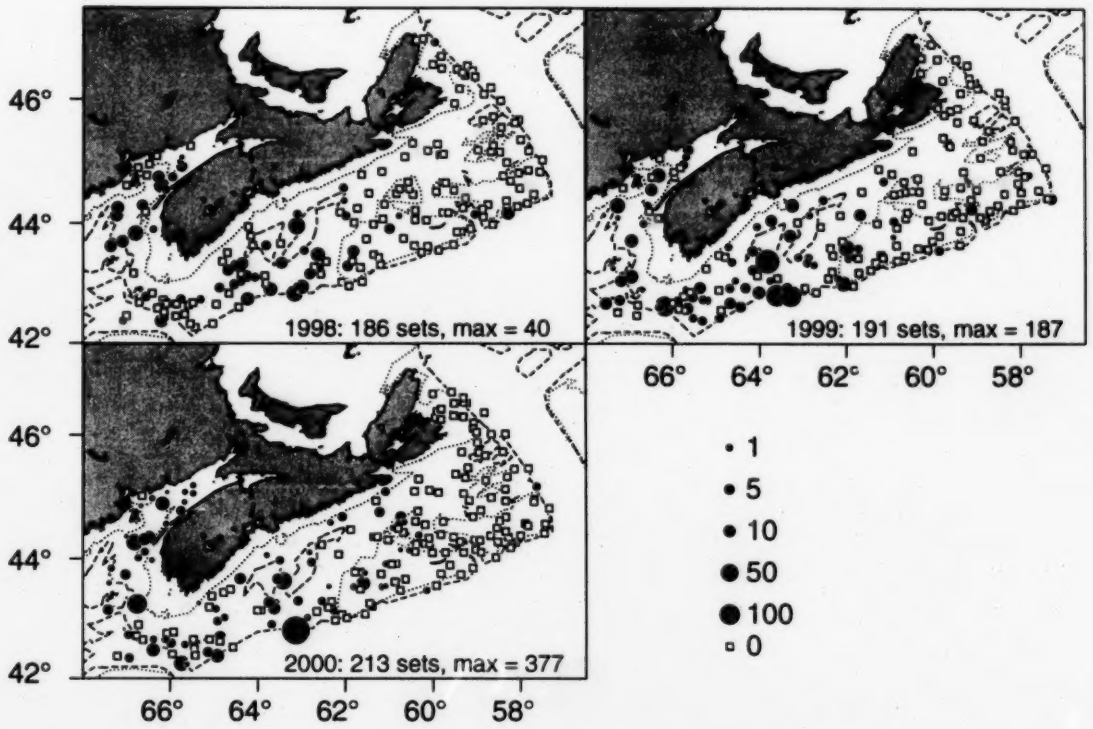

Fig. 27. 4VWX Pollock Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

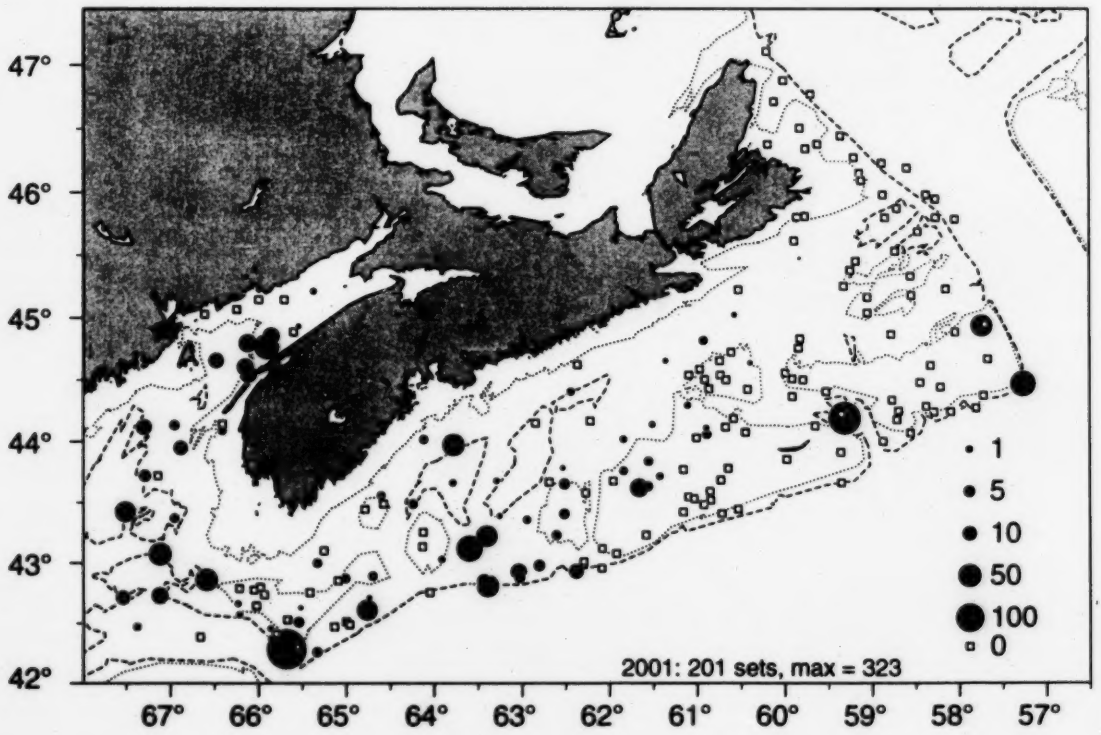

Fig. 28. 4VWX Pollock Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

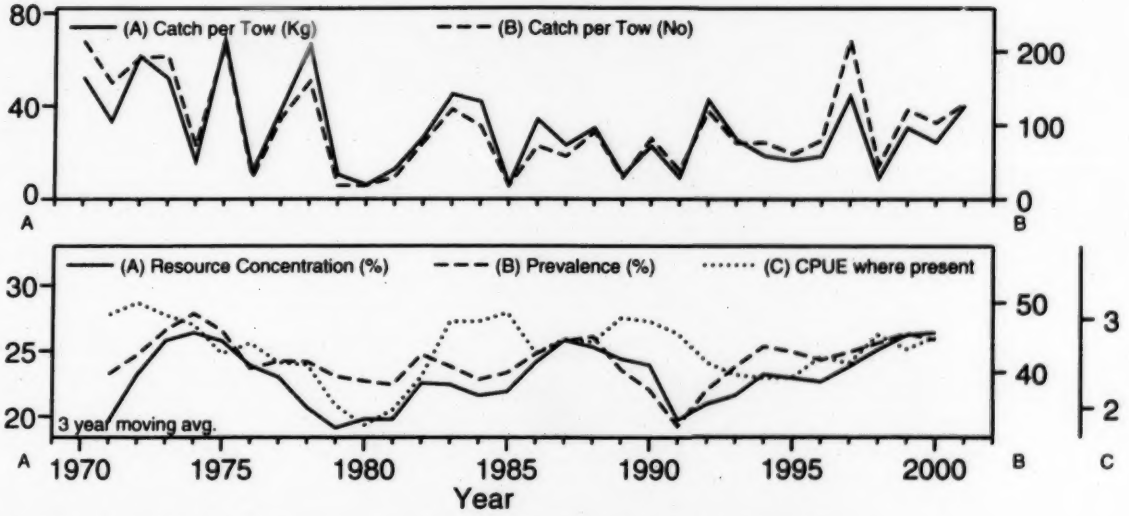

Fig. 29. Unit3 Redfish stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

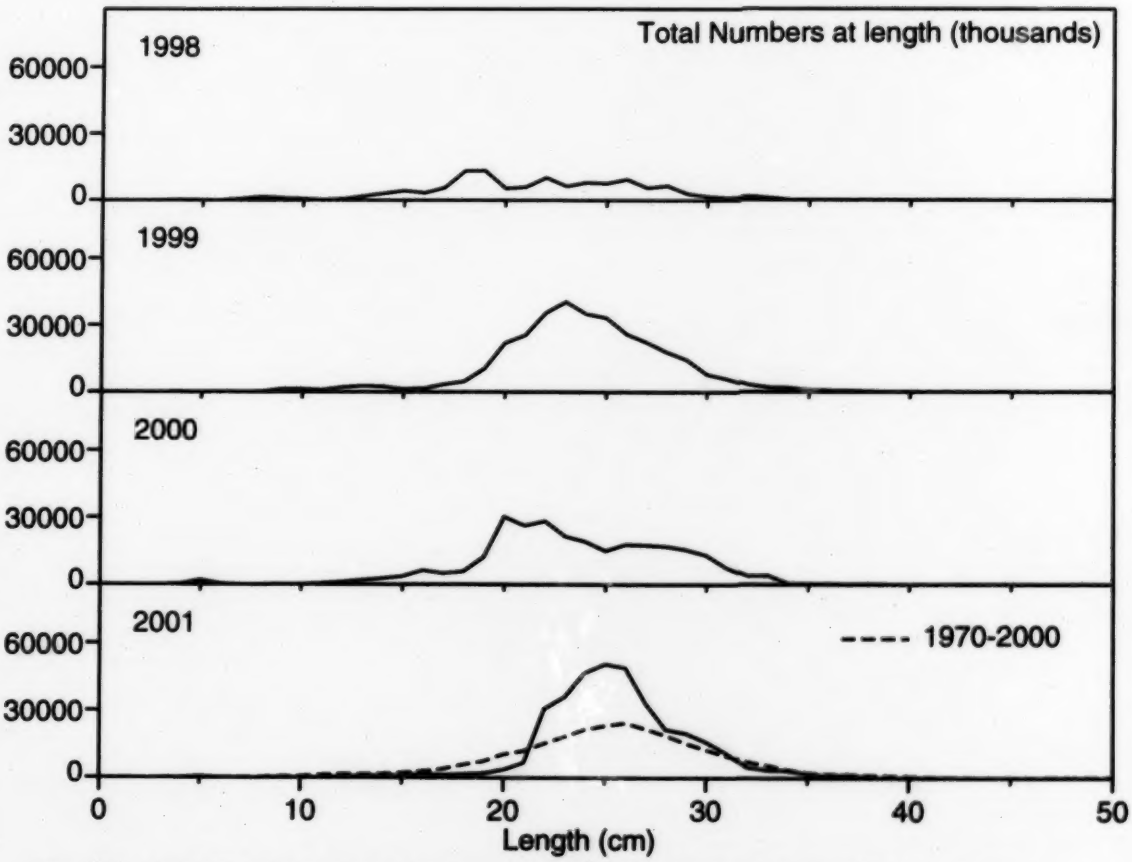

Fig. 30. Unit3 Redfish length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

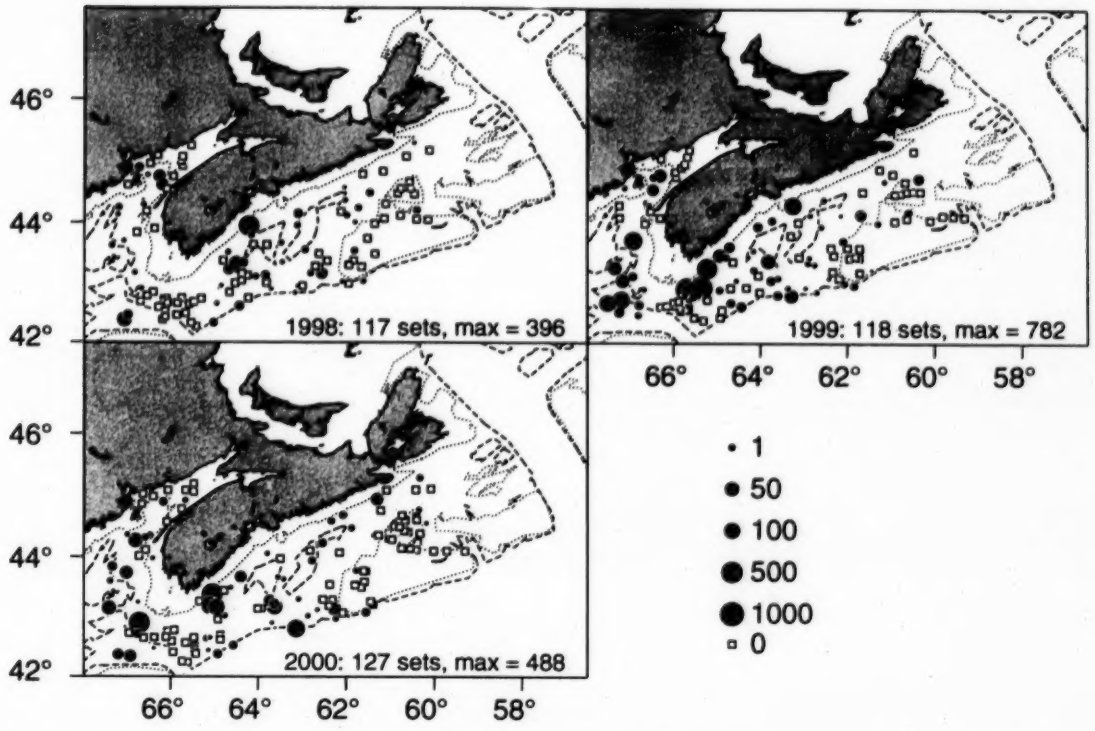

Fig. 31. Unit3 Redfish Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

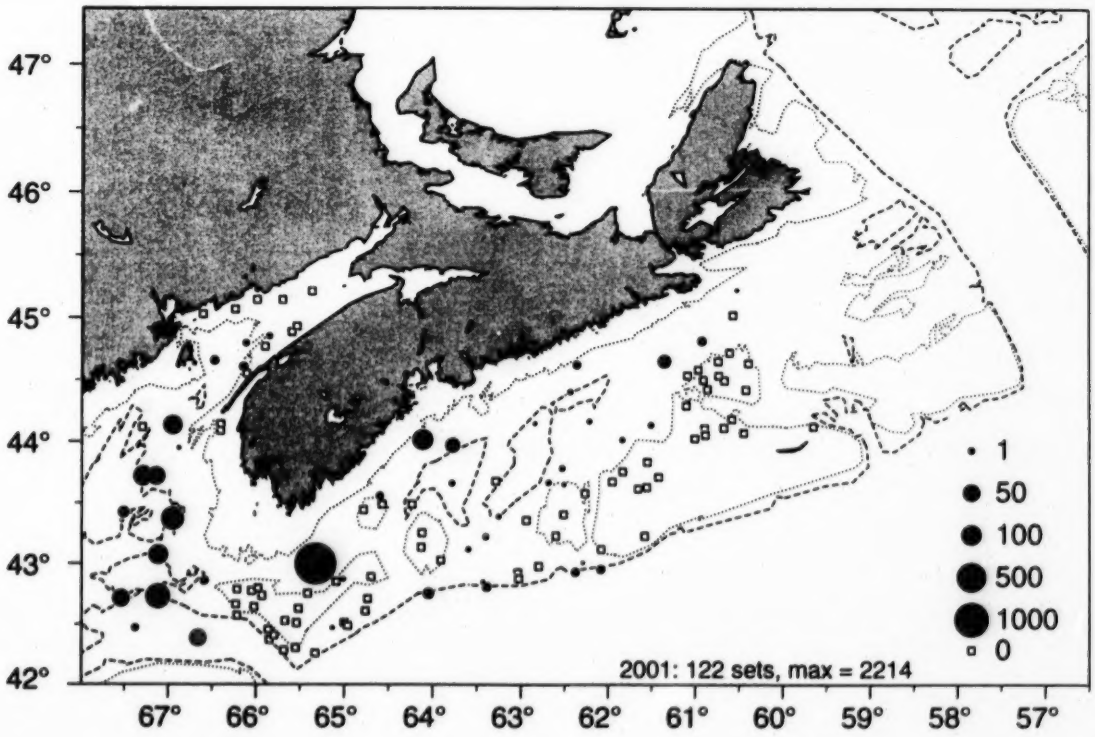

Fig. 32. Unit3 Redfish Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

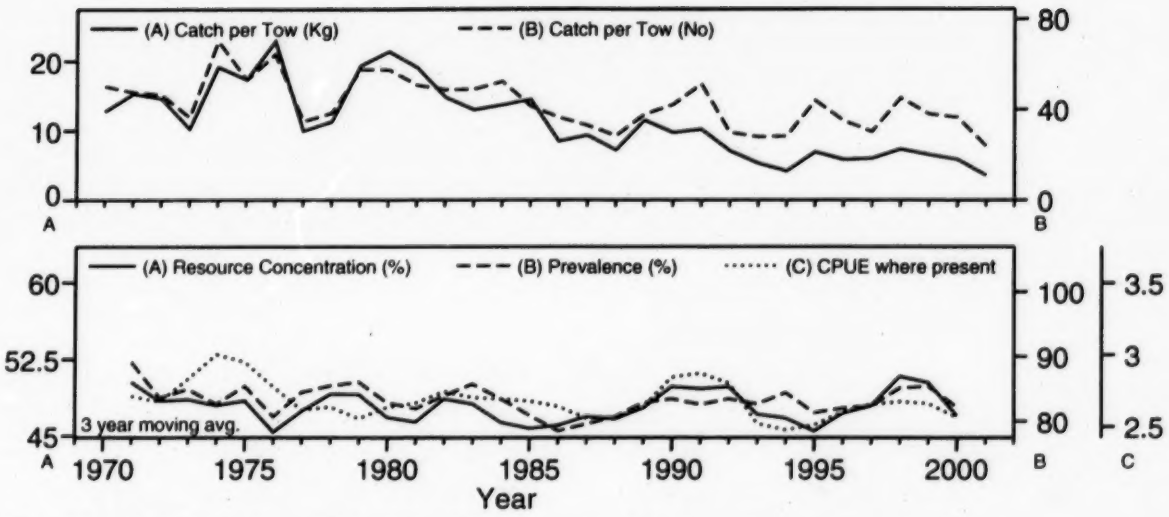

Fig. 33. 4VW American Plaice stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

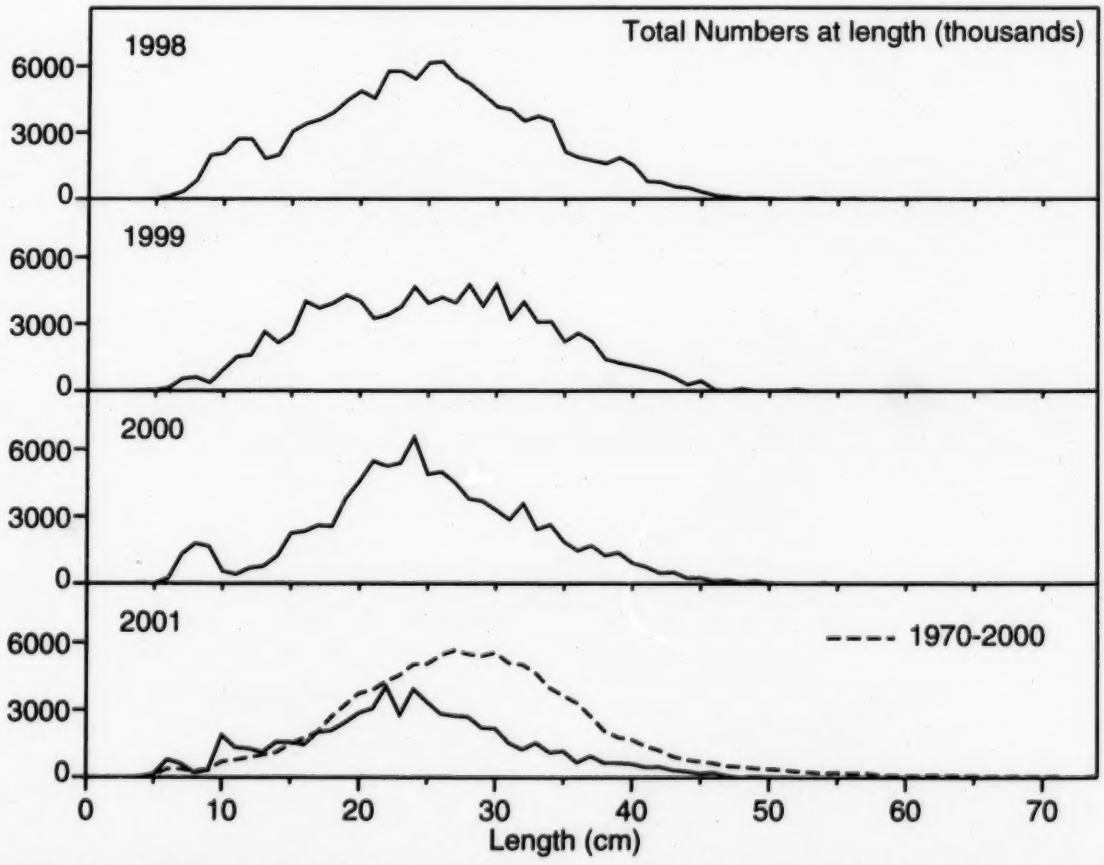

Fig. 34. 4VW American Plaice length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

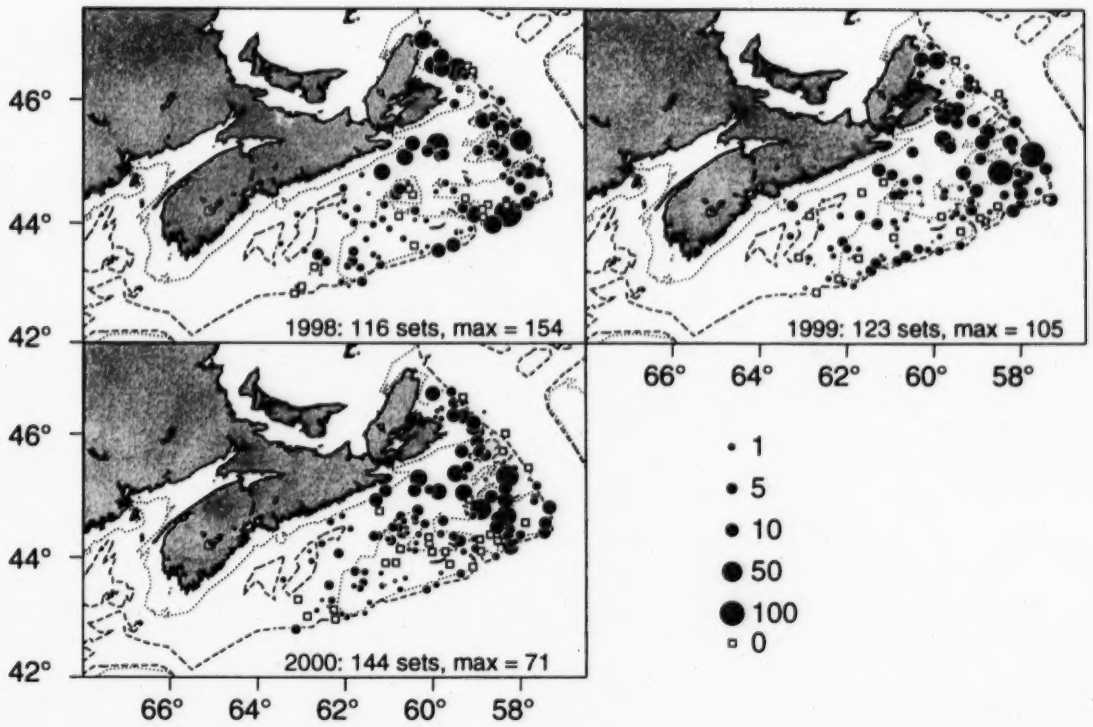

Fig. 35. 4VW American Plaice Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

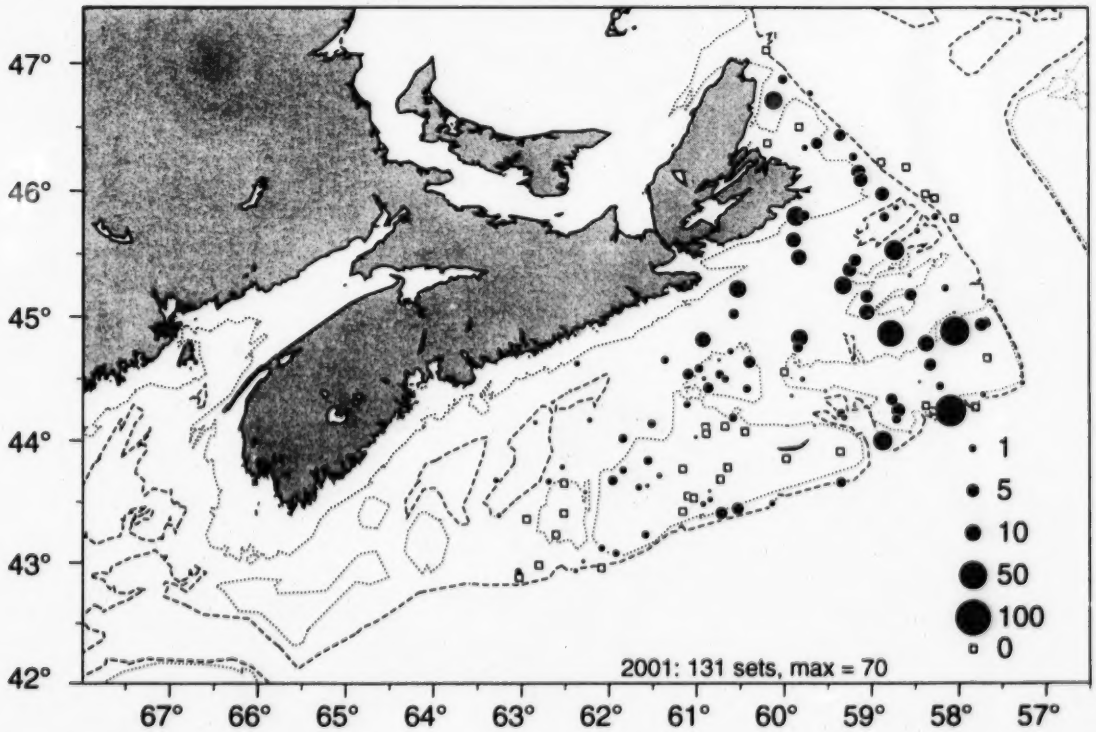

Fig. 36. 4VW American Plaice Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

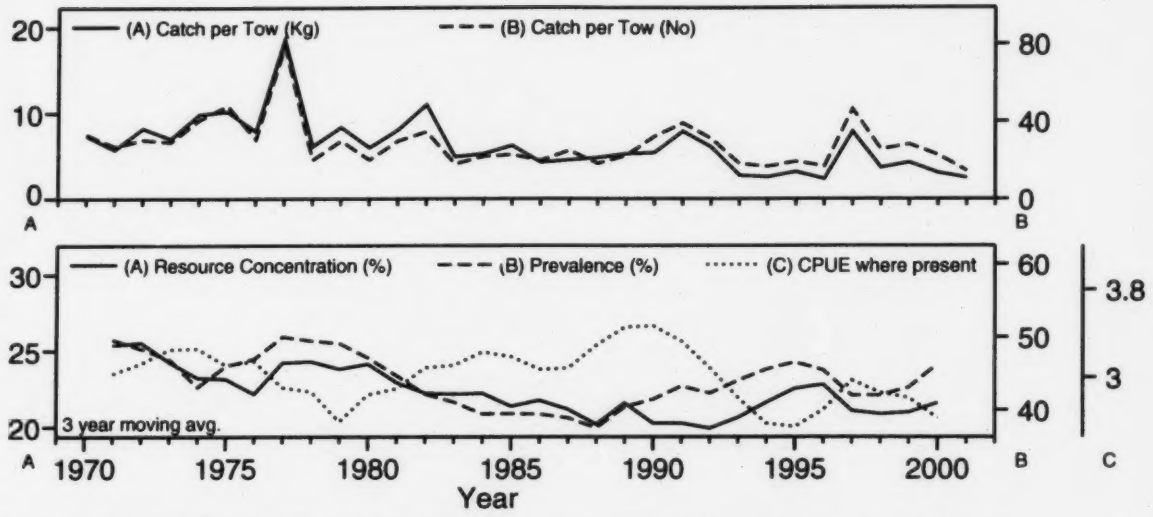

Fig. 37. 4VW Yellowtail Flounder stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

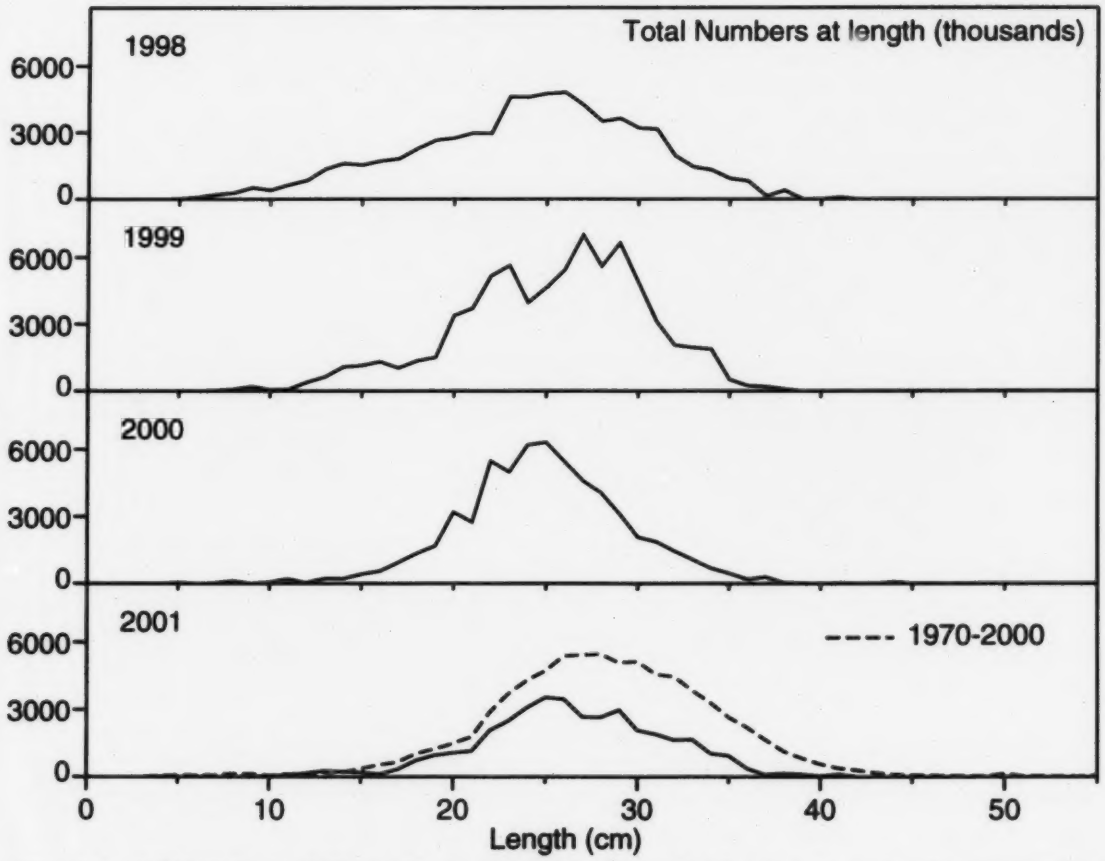

Fig. 38. 4VW Yellowtail Flounder length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

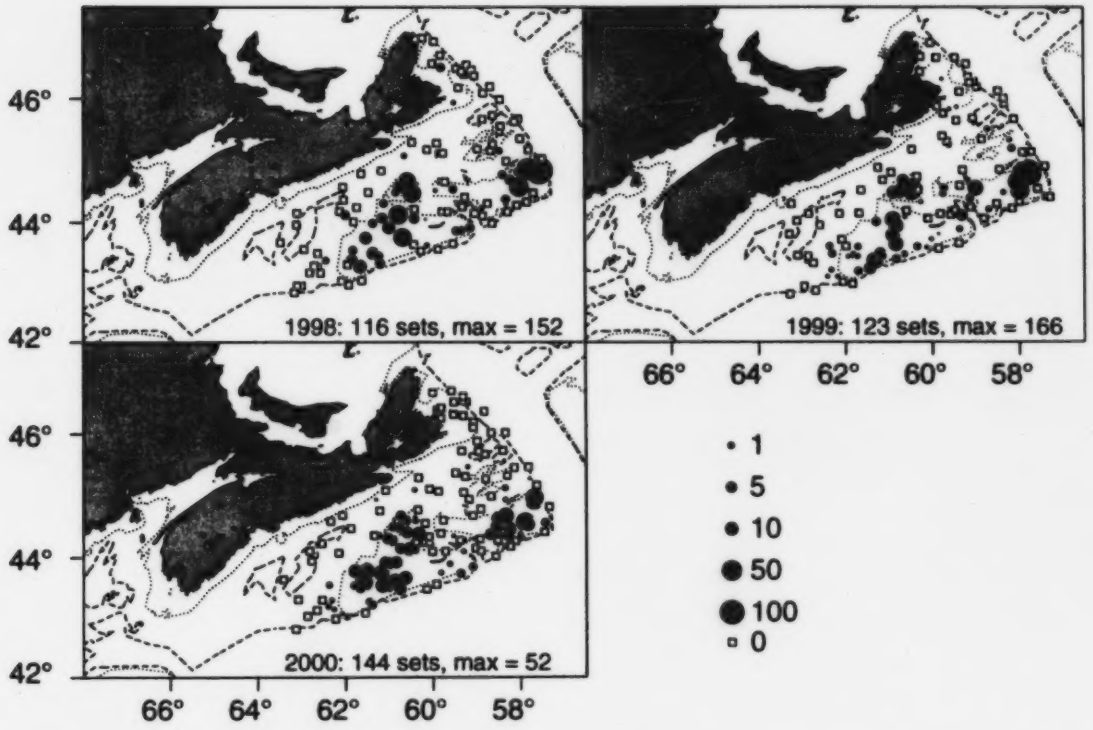

Fig. 39. 4VW Yellowtail Flounder Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

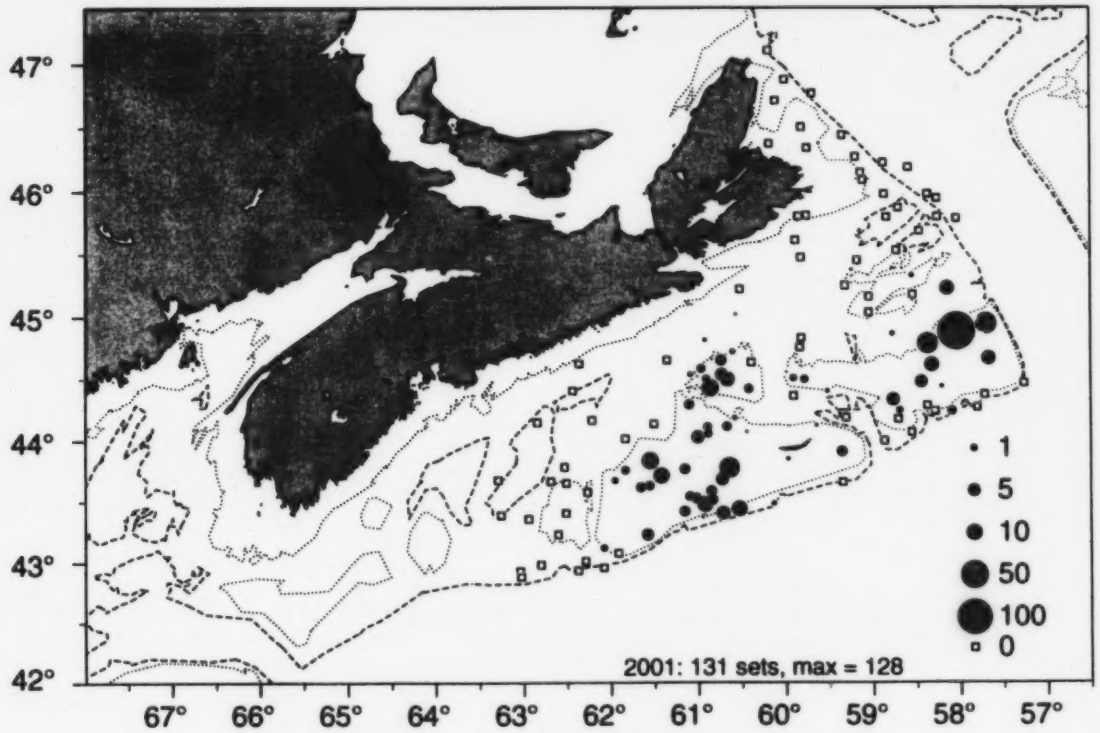

Fig. 40. 4VW Yellowtail Flounder Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

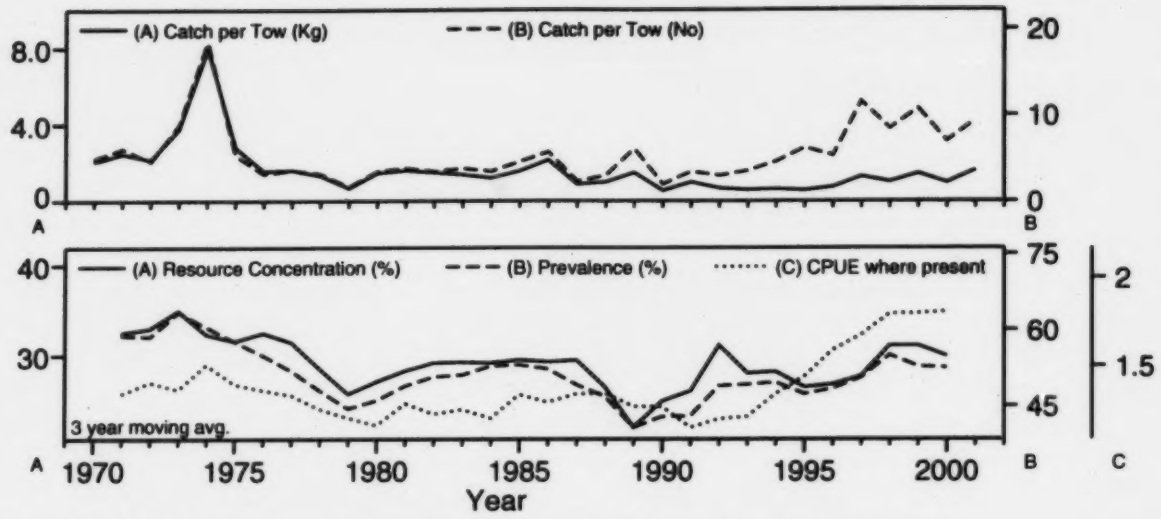

Fig. 41. 4VW Witch Flounder stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

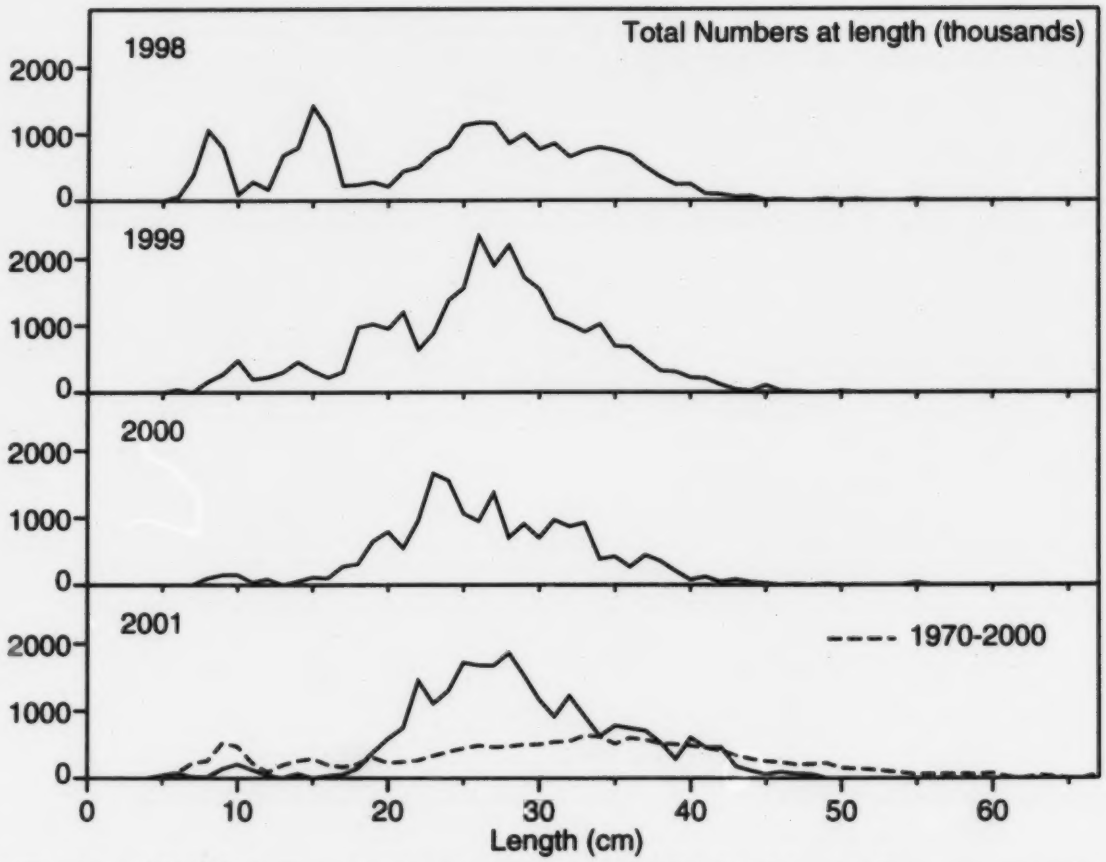

Fig. 42. 4VW Witch Flounder length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

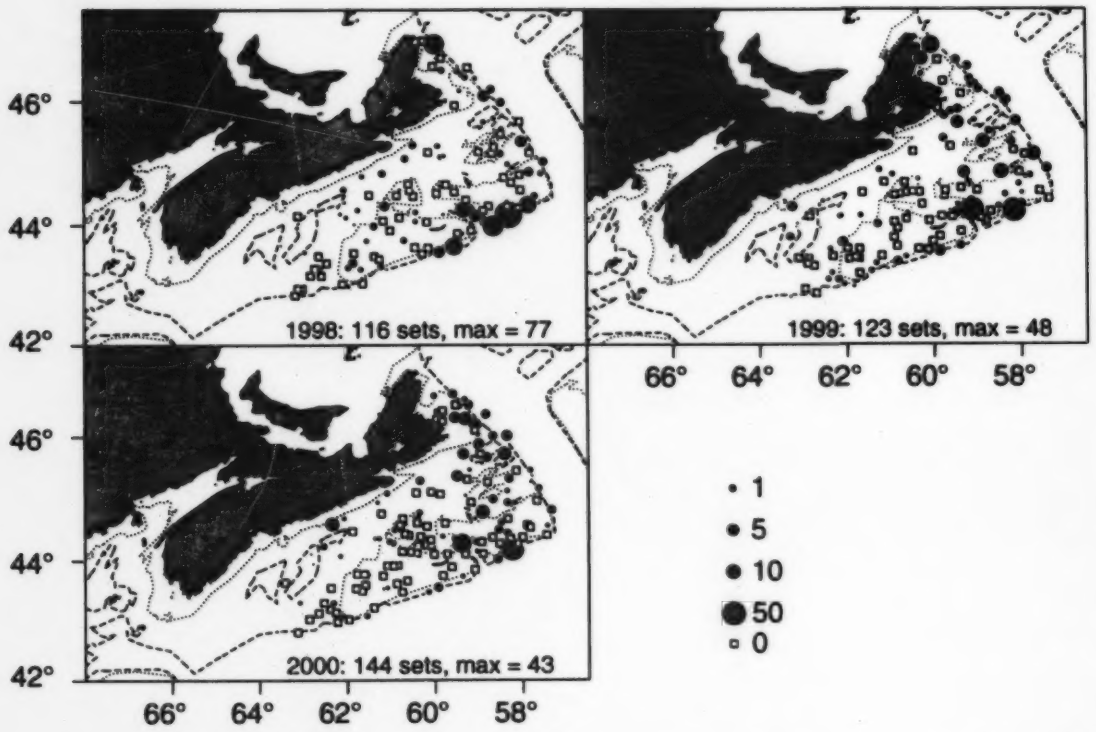

Fig. 43. 4VW Witch Flounder Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

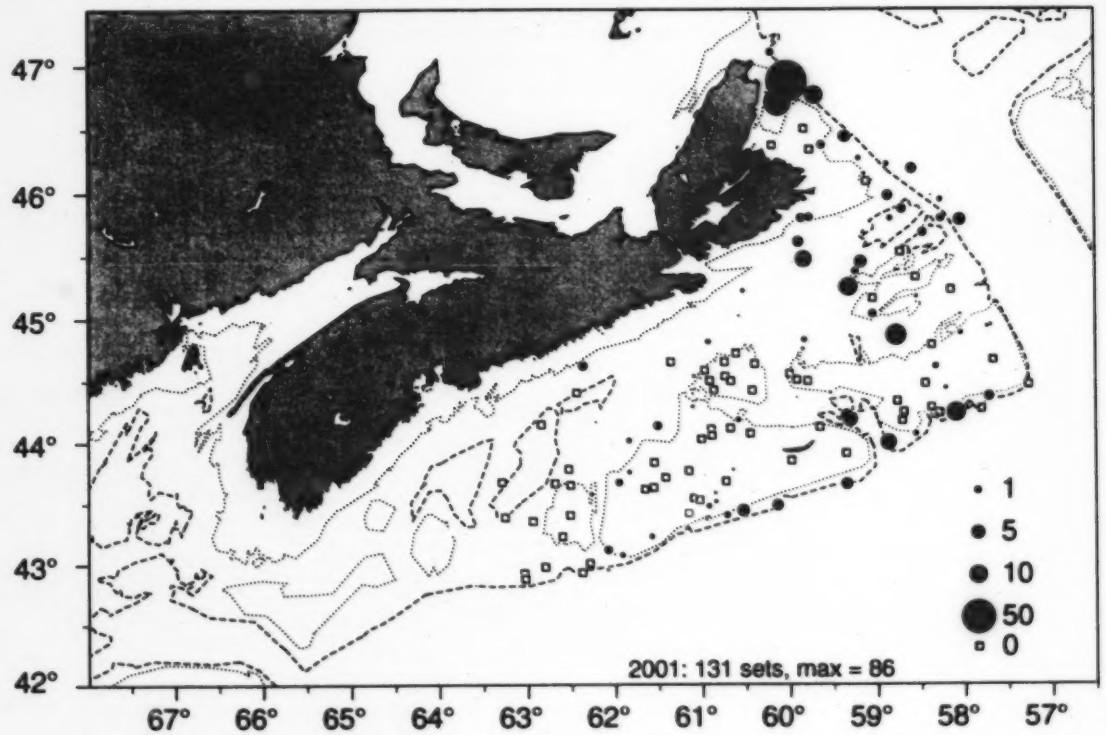

Fig. 44. 4VW Witch Flounder Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

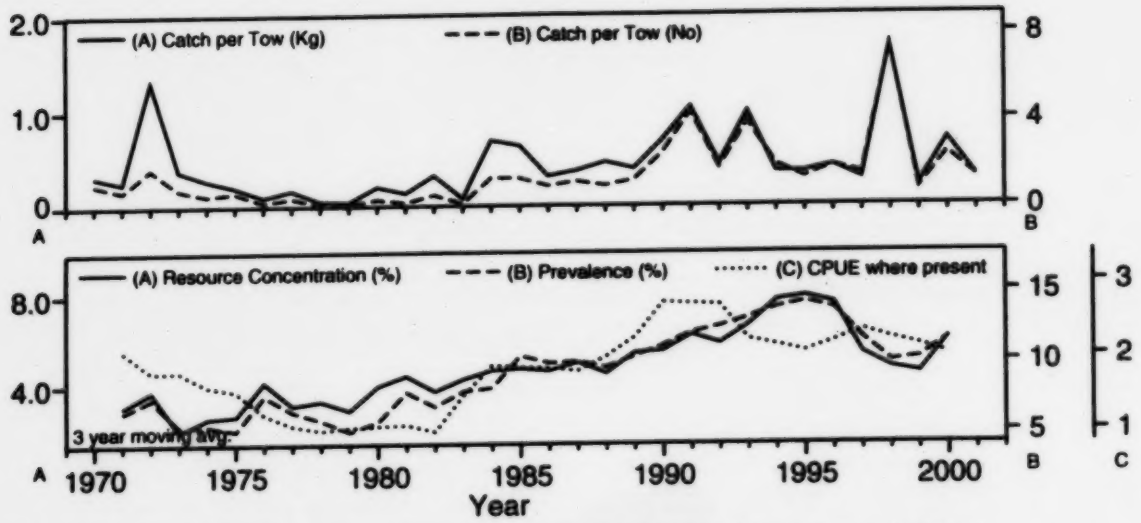

Fig. 45. 4VW Winter Flounder stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

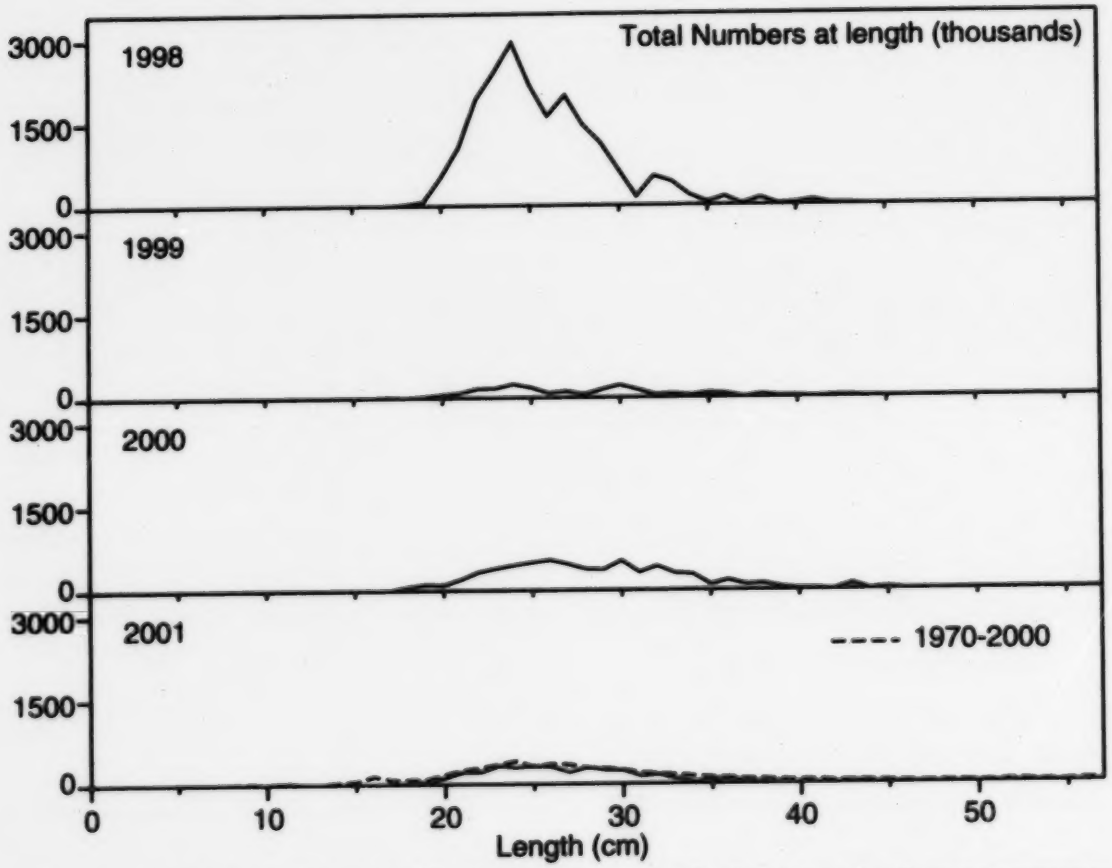

Fig. 46. 4VW Winter Flounder length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

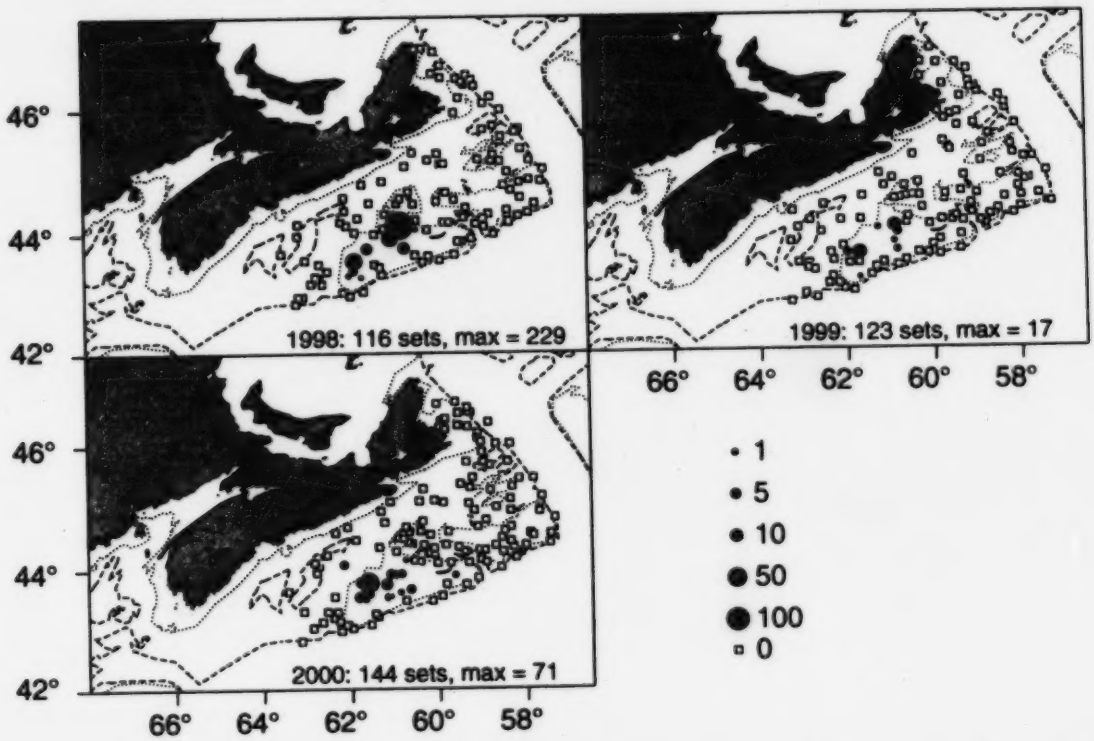

Fig. 47. 4VW Winter Flounder Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

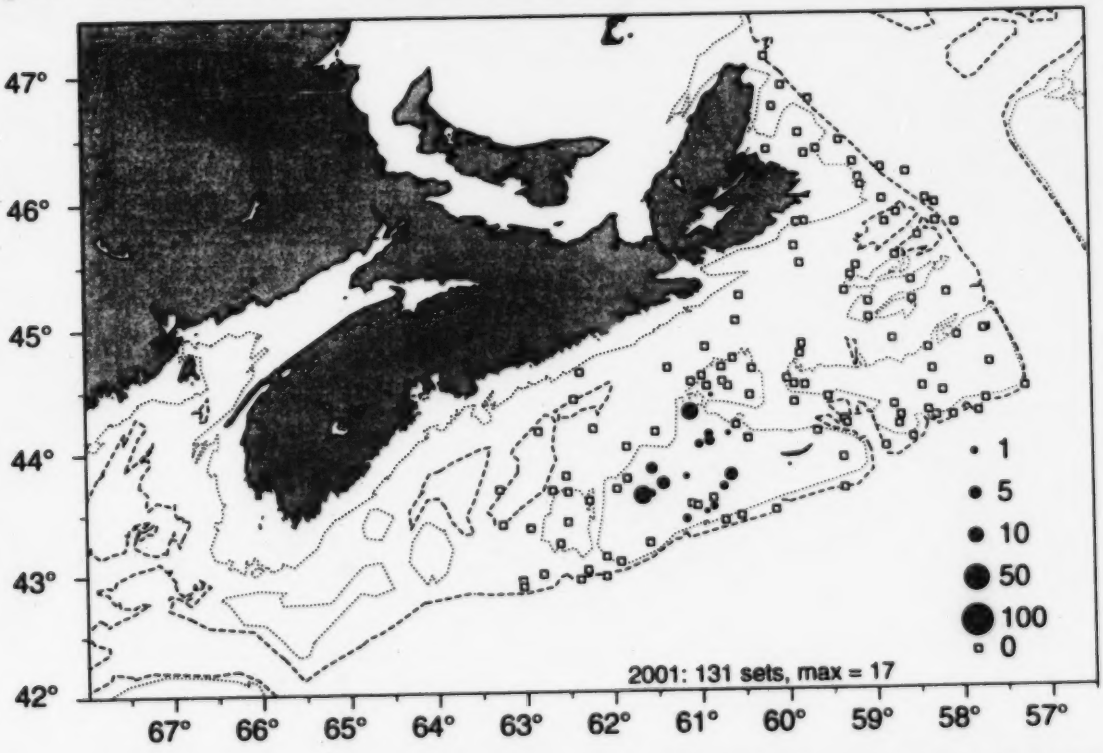

Fig. 48. 4VW Winter Flounder Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

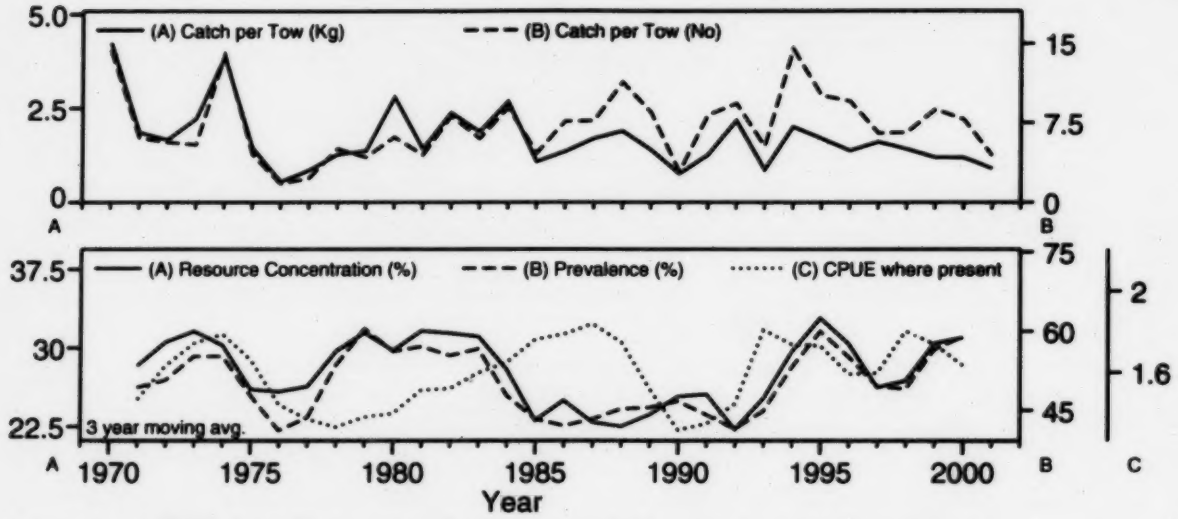

Fig. 49. 4X American Plaice stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

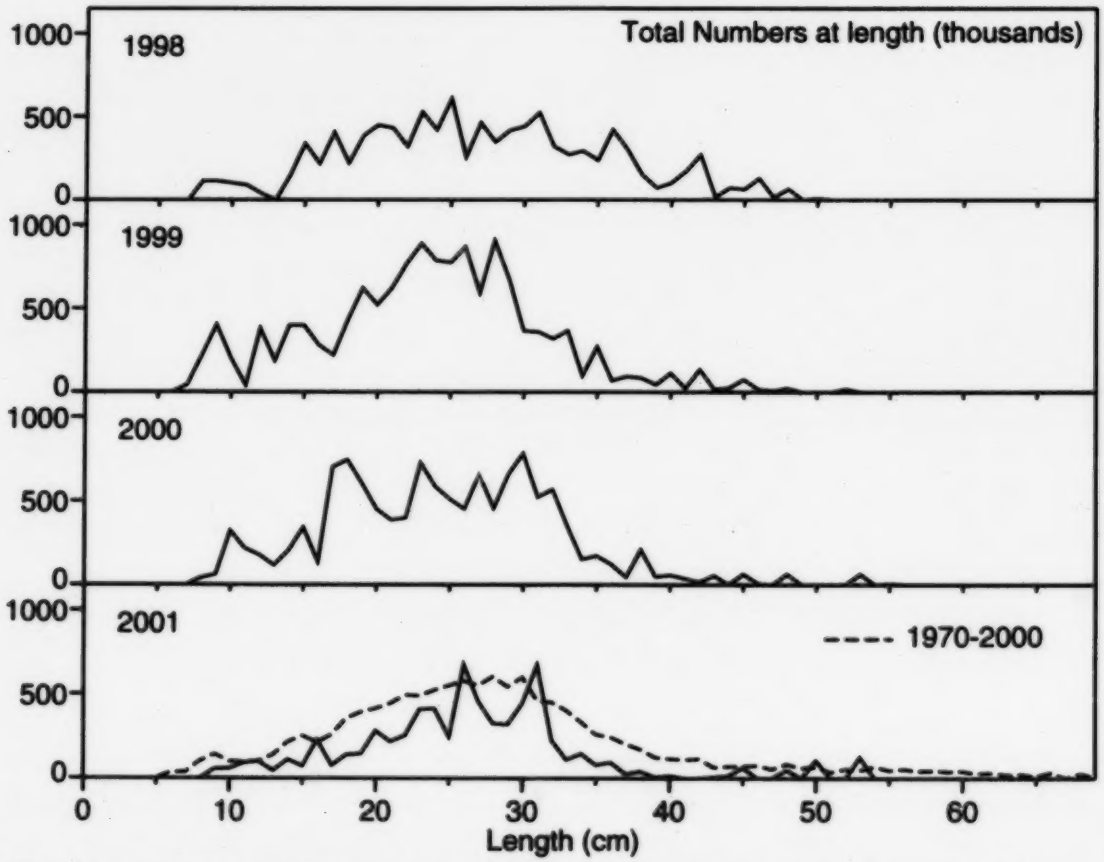

Fig. 50. 4X American Plaice length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

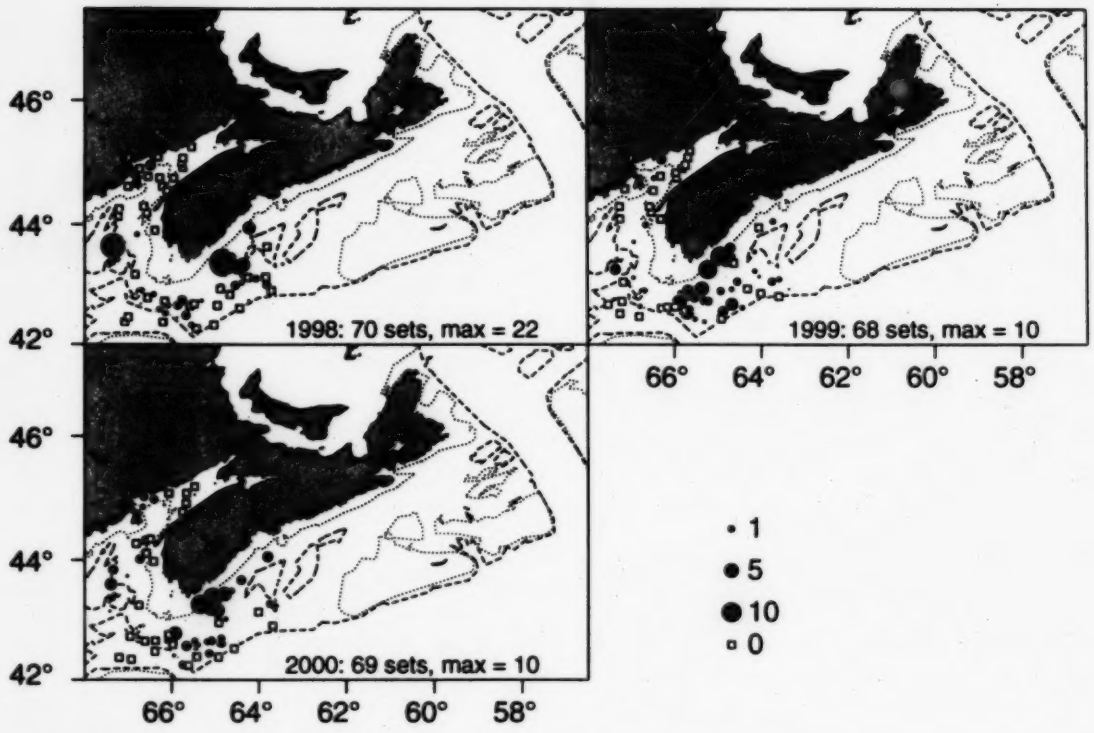

Fig. 51. 4X American Plaice Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

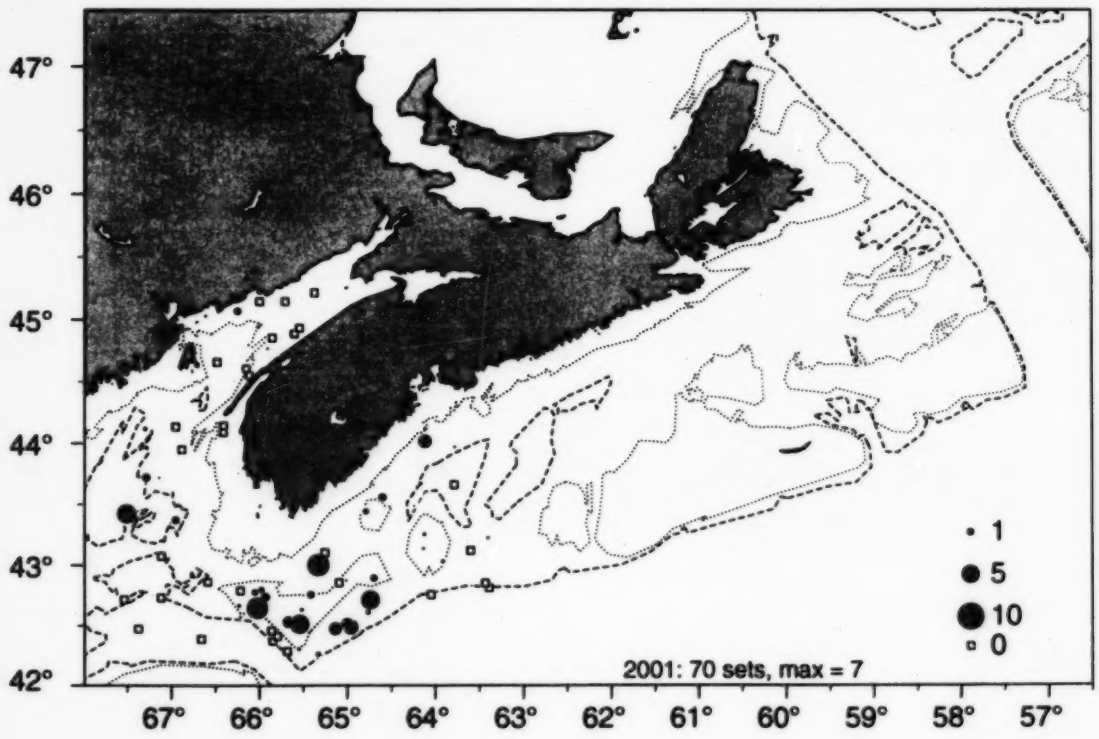

Fig. 52. 4X American Plaice Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

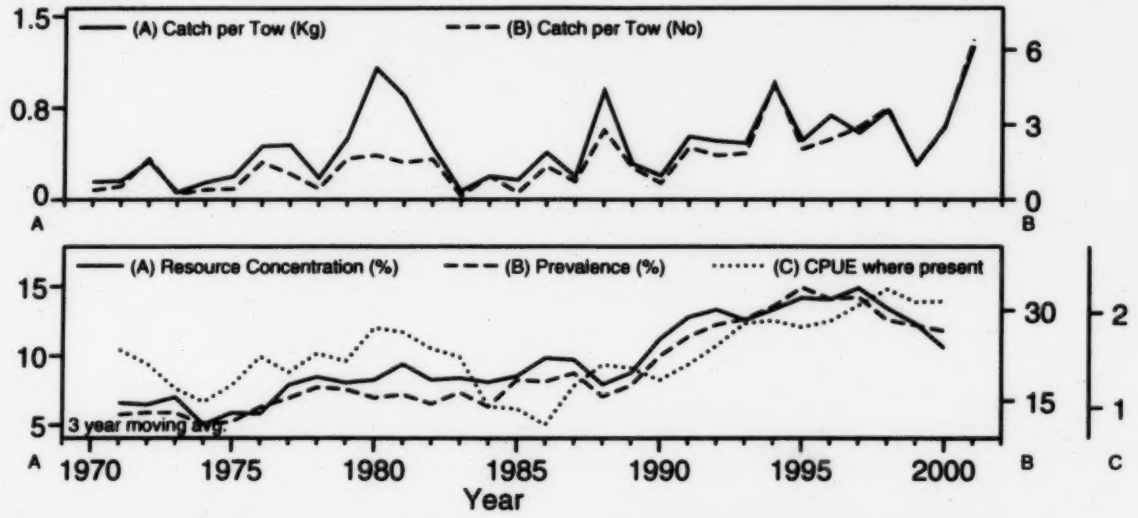

Fig. 53. 4X Yellowtail Flounder stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

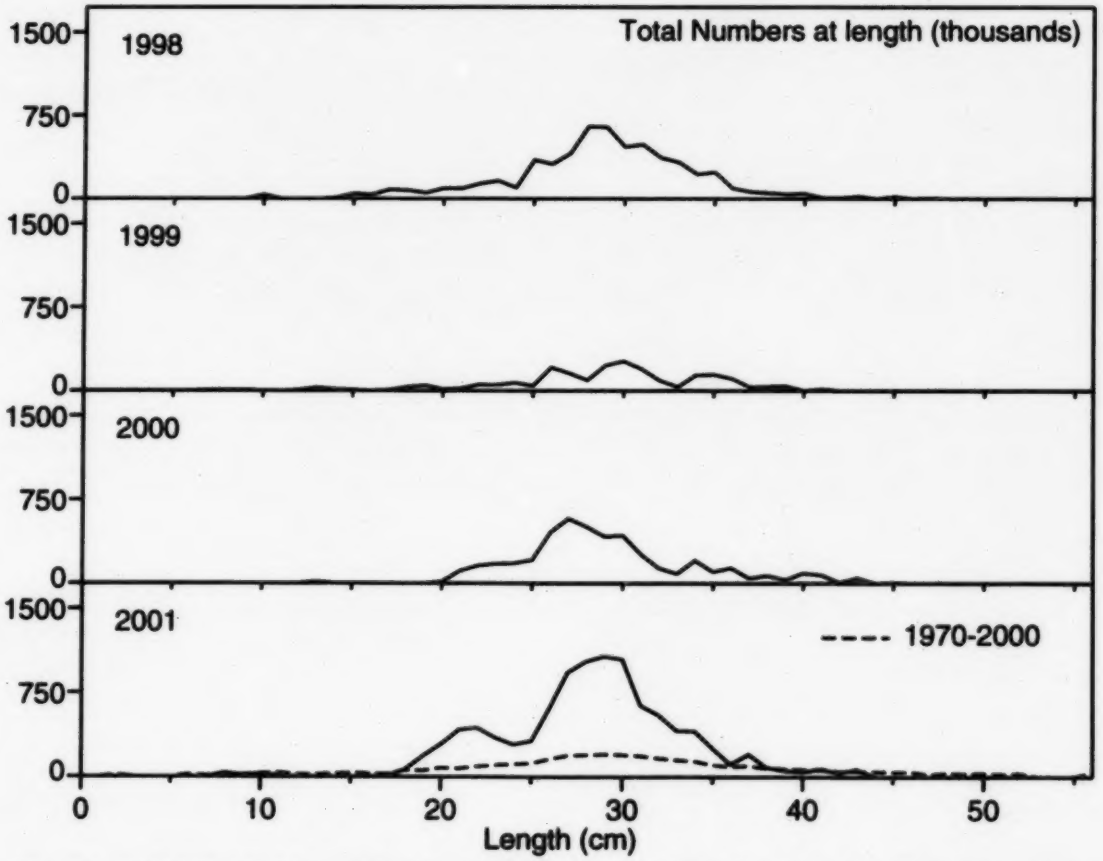

Fig. 54. 4X Yellowtail Flounder length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

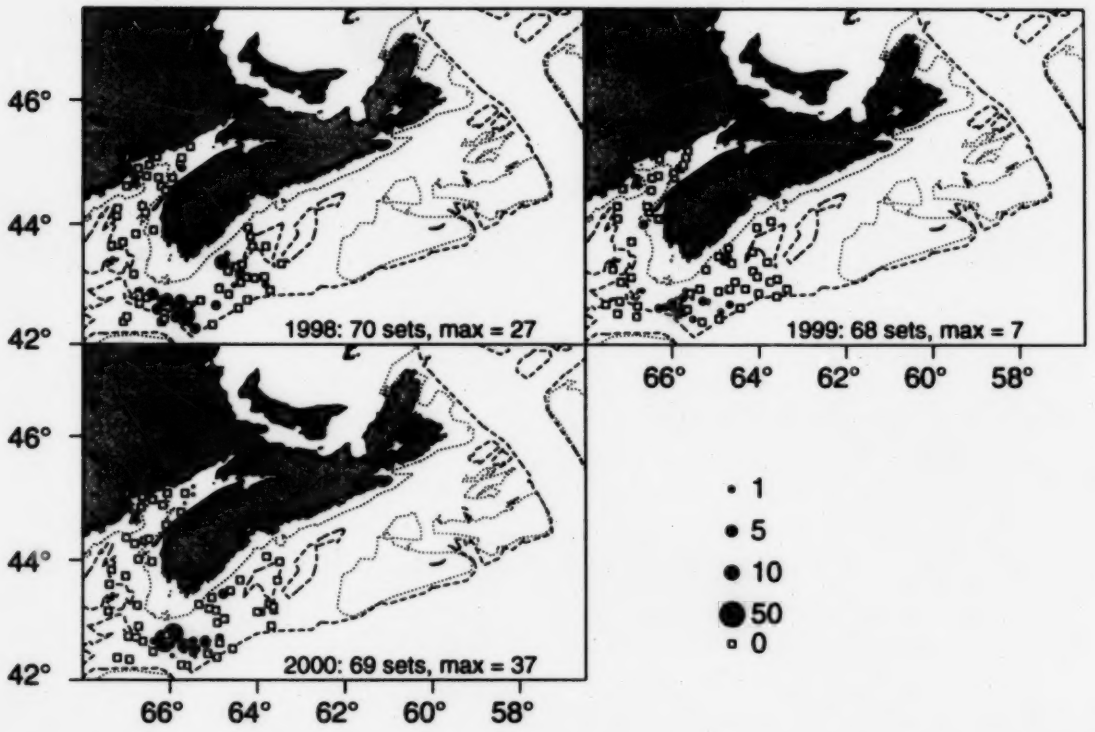

Fig. 55. 4X Yellowtail Flounder Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

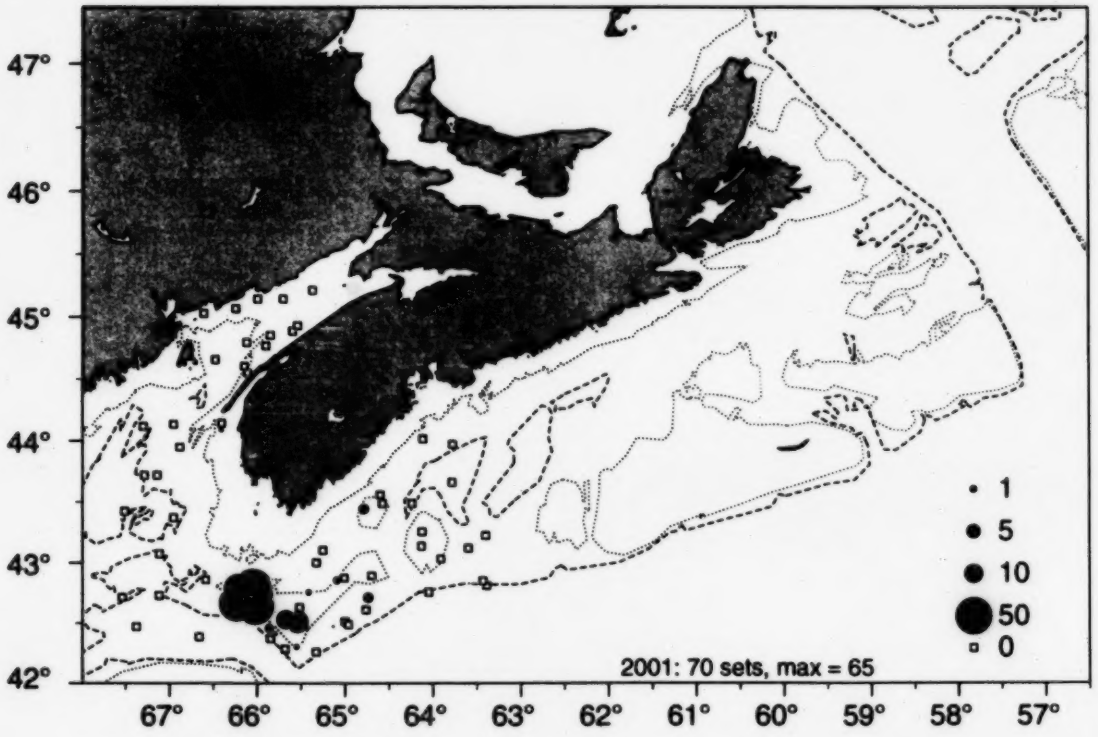

Fig. 56. 4X Yellowtail Flounder Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

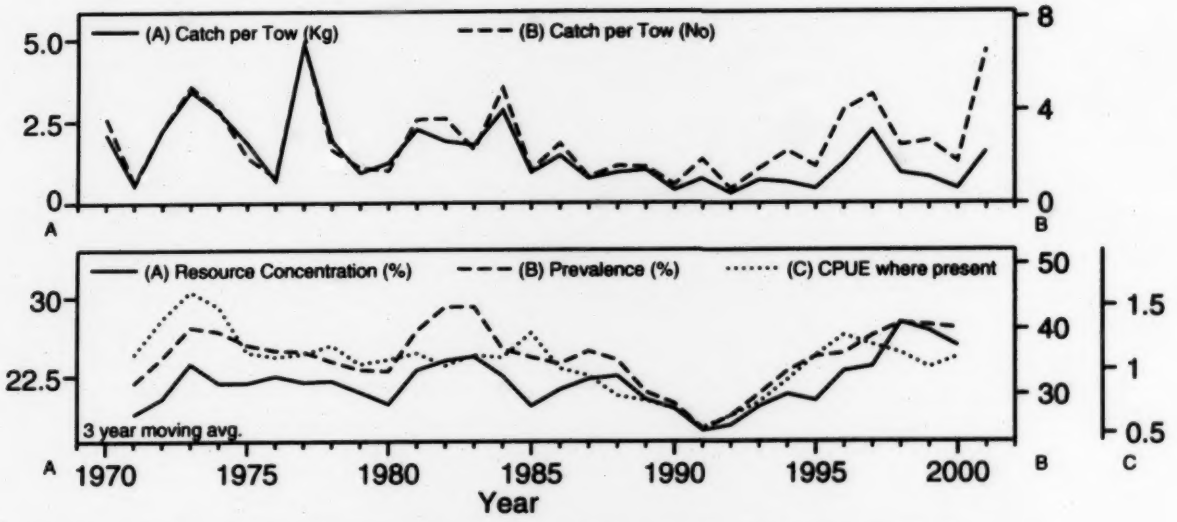

Fig. 57. 4X Witch Flounder stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

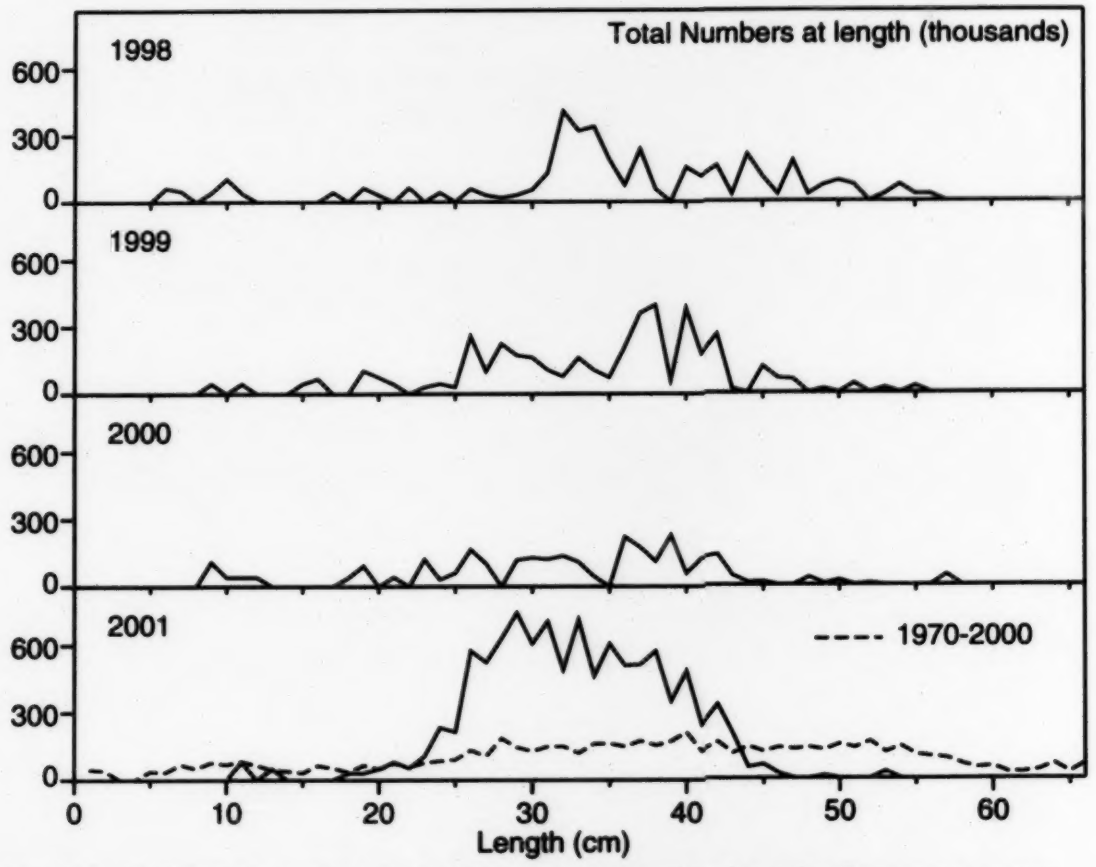

Fig. 58. 4X Witch Flounder length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

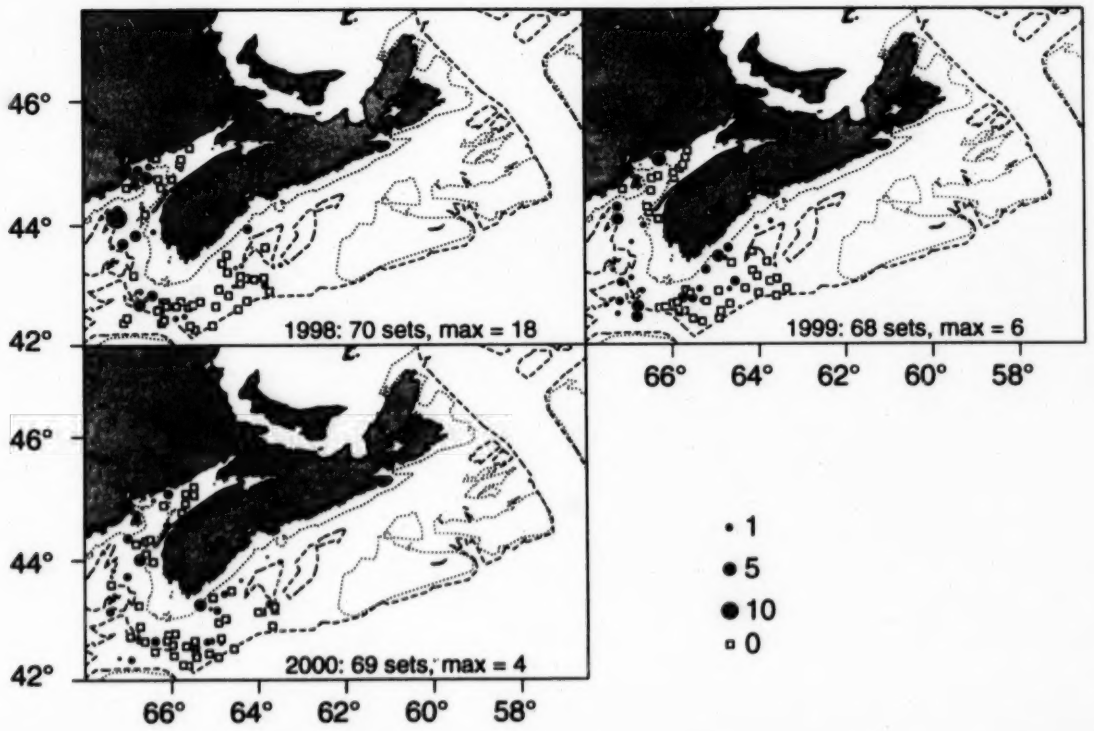

Fig. 59. 4X Witch Flounder Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

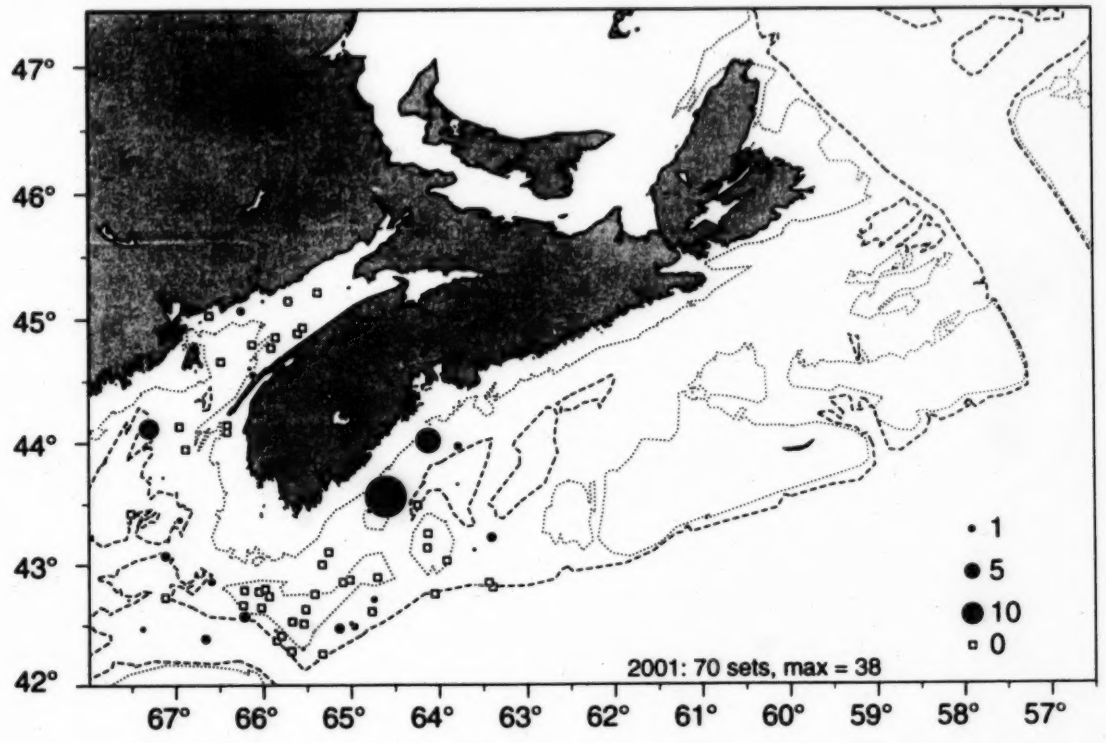

Fig. 60. 4X Witch Flounder Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

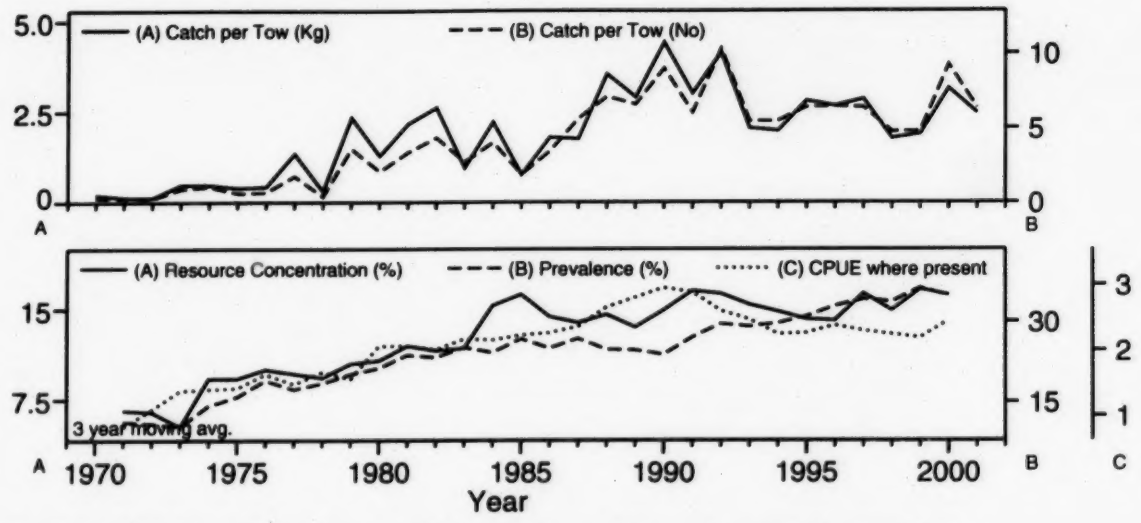

Fig. 61. 4X Winter Flounder stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

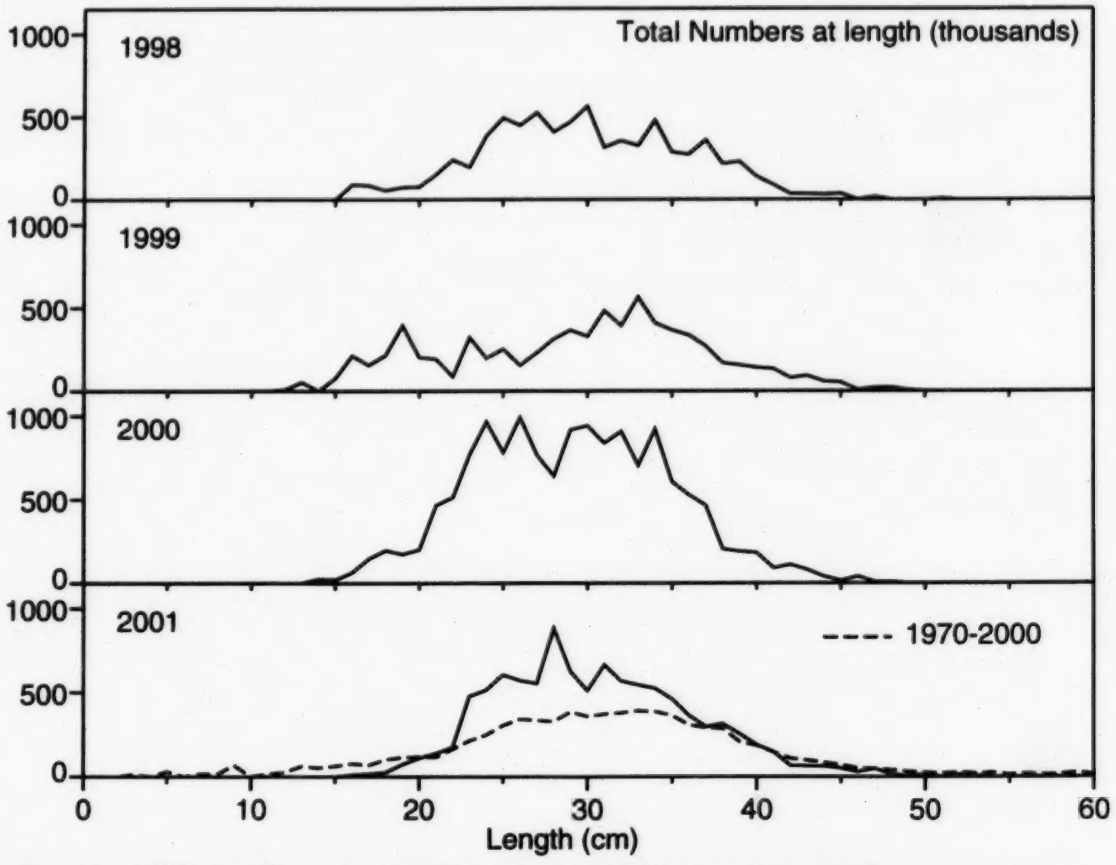

Fig. 62. 4X Winter Flounder length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

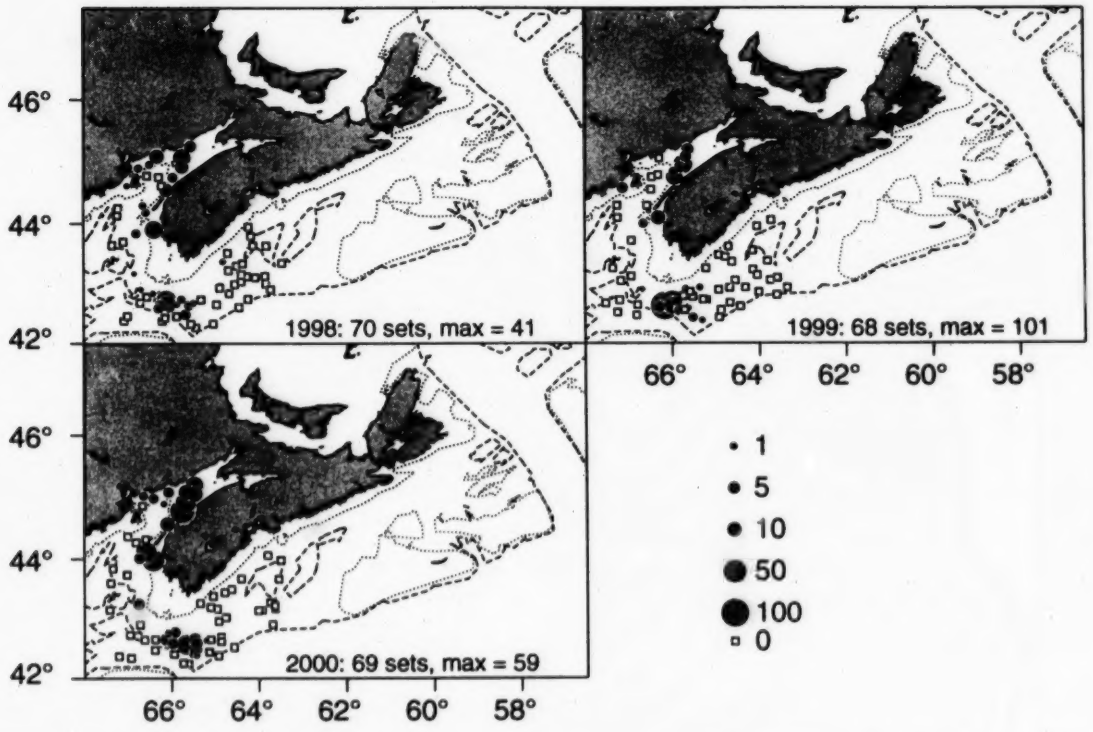

Fig. 63. 4X Winter Flounder Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

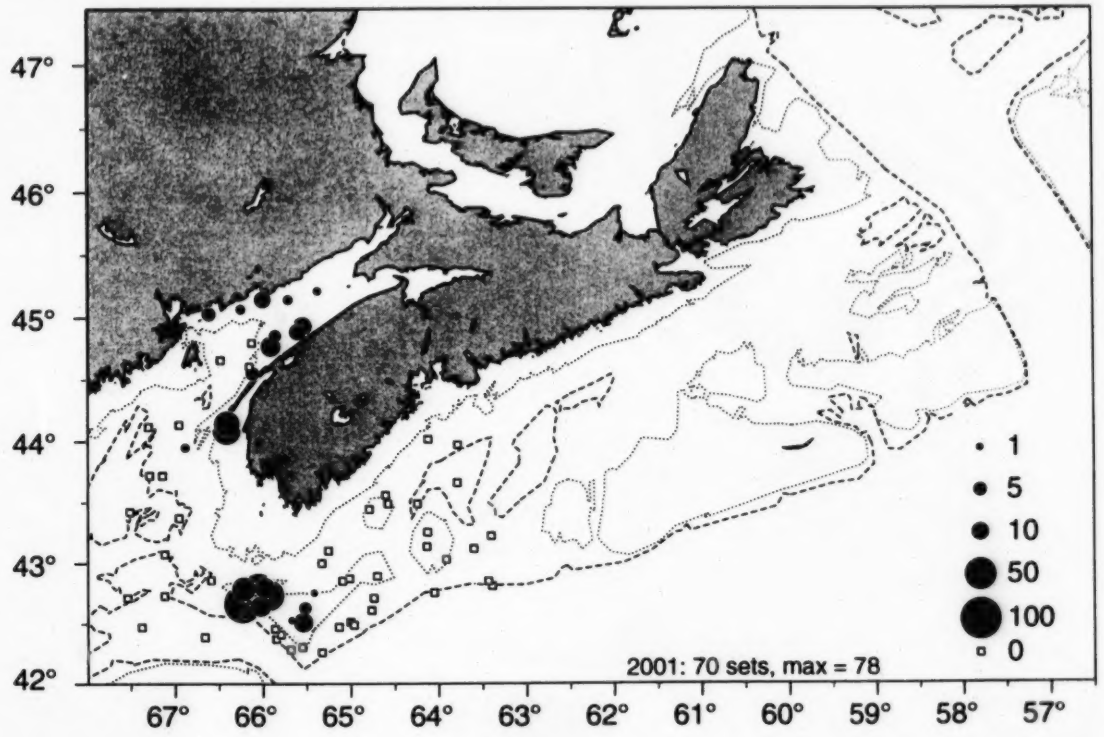

Fig. 64. 4X Winter Flounder Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

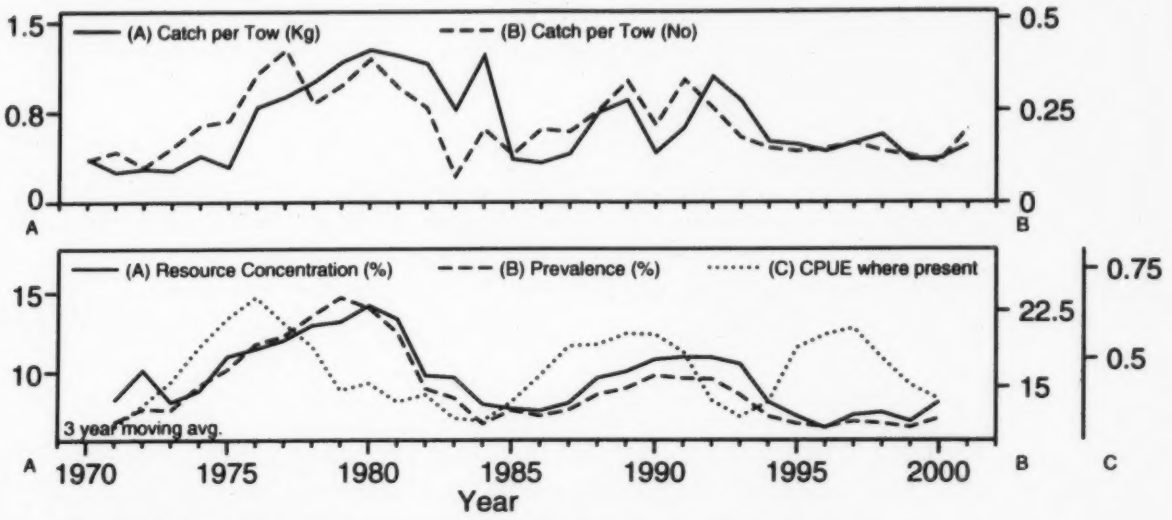

Fig. 65. 4VWX Halibut stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

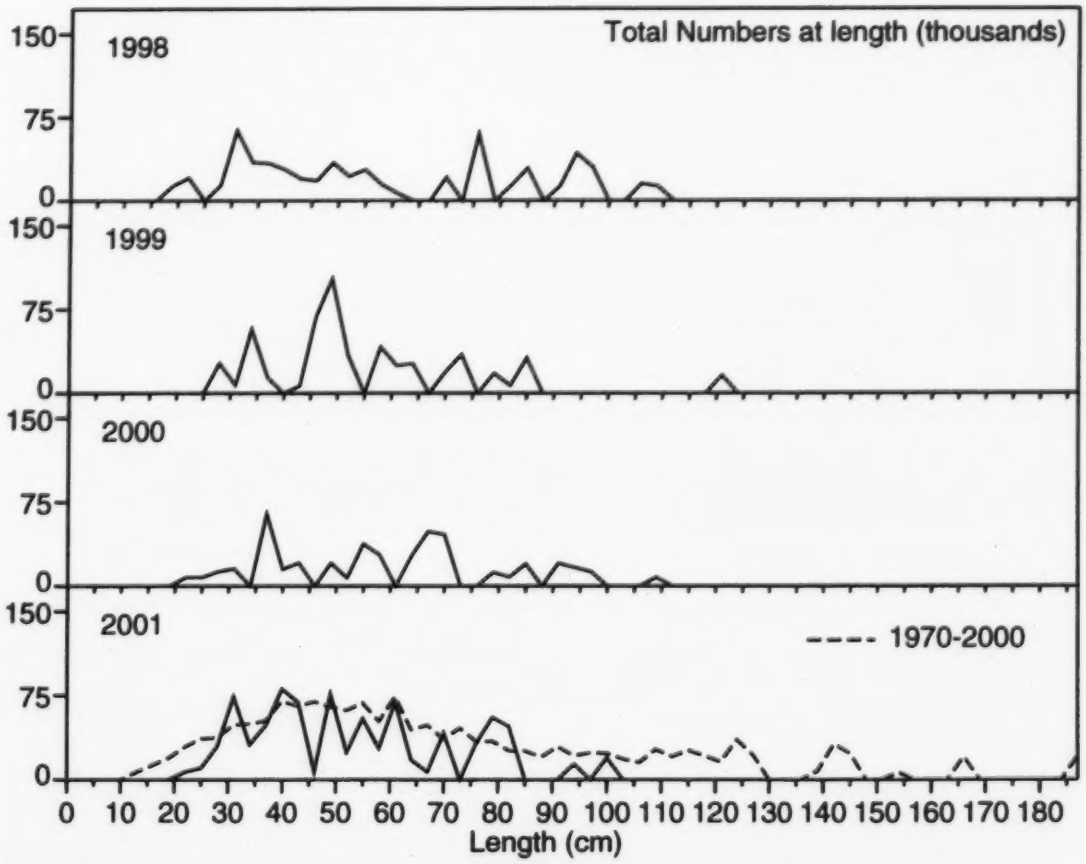

Fig. 66. 4VWX Halibut length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

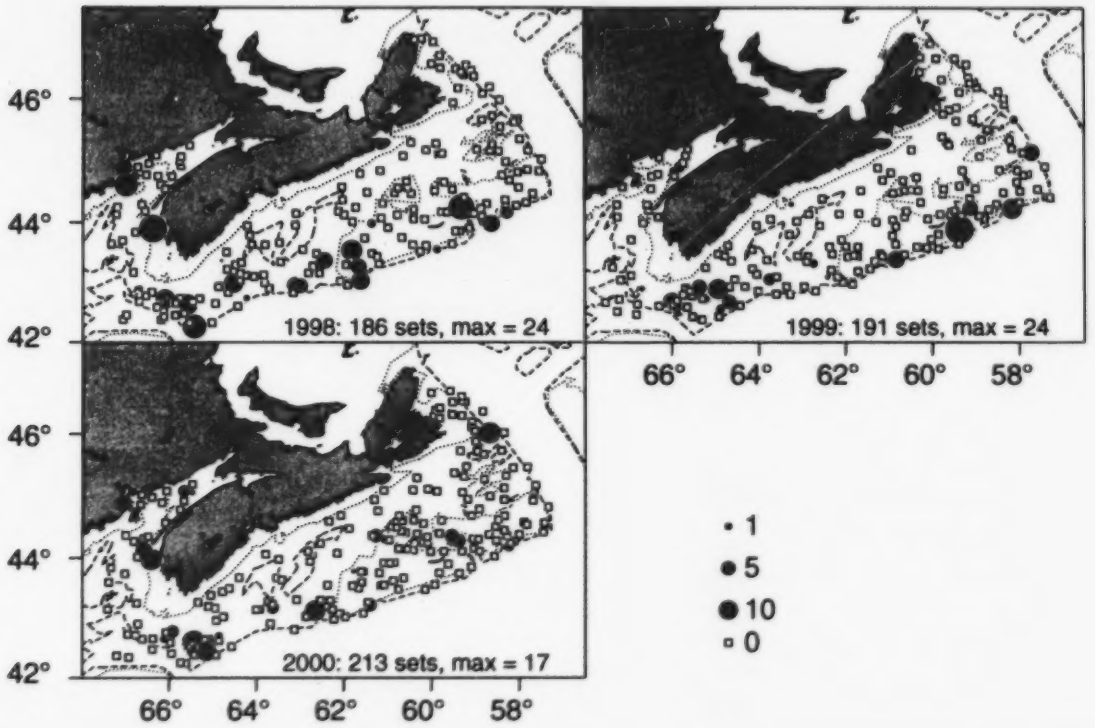

Fig. 67. 4VWX Halibut Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

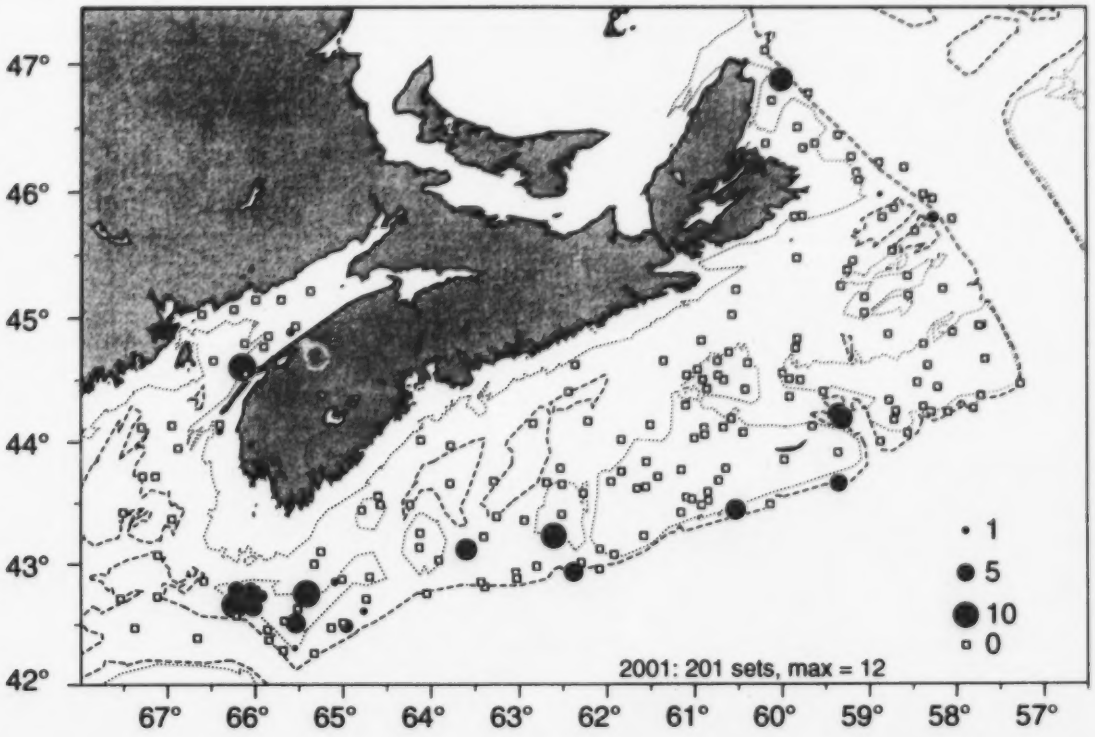

Fig. 68. 4VWX Halibut Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

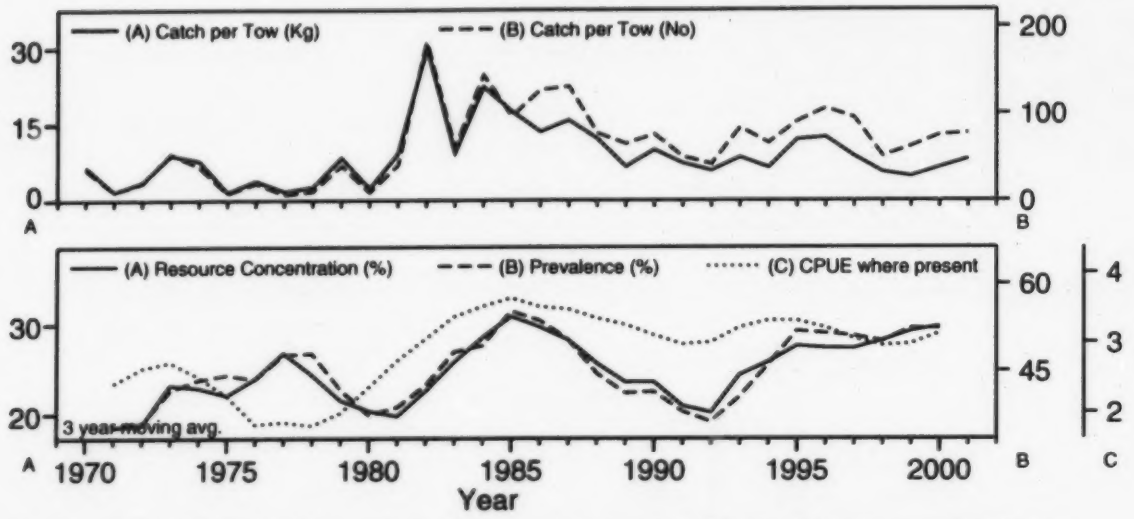

Fig. 69. 4VWX-484/495 Silver Hake stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

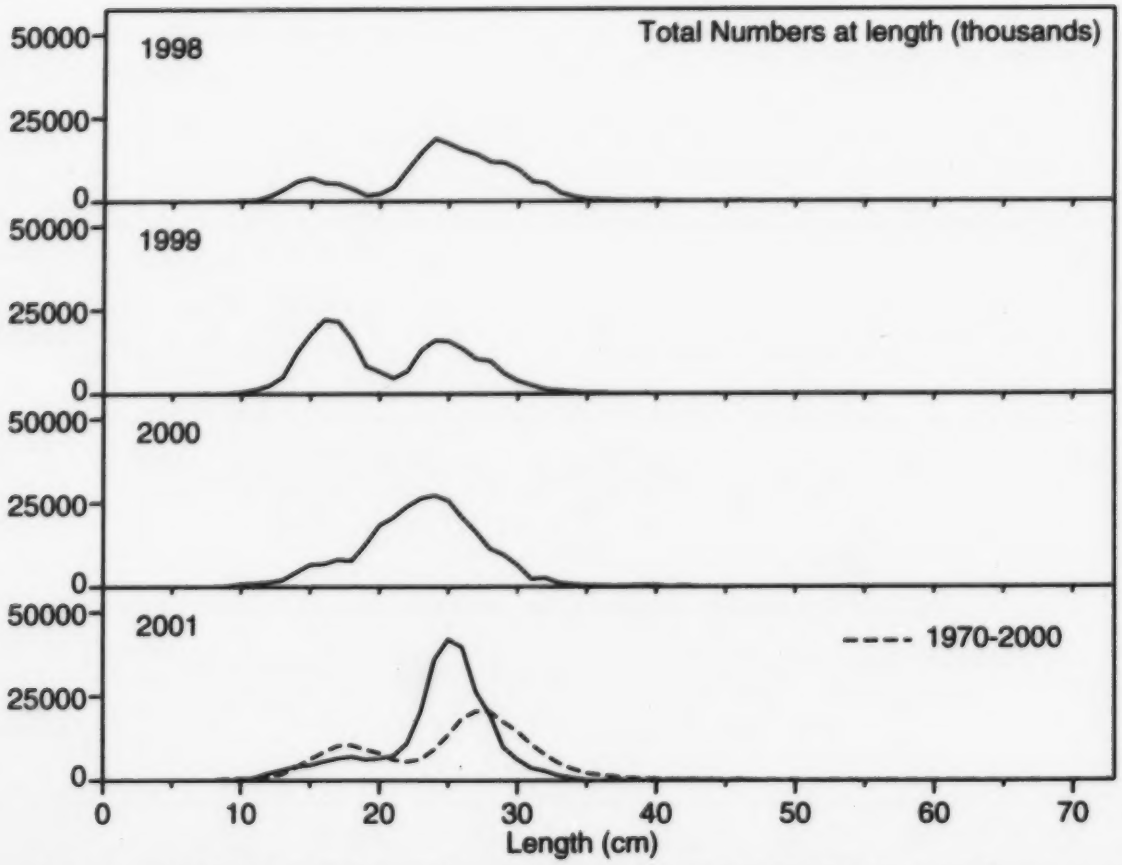

Fig. 70. 4VWX-484/495 Silver Hake length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

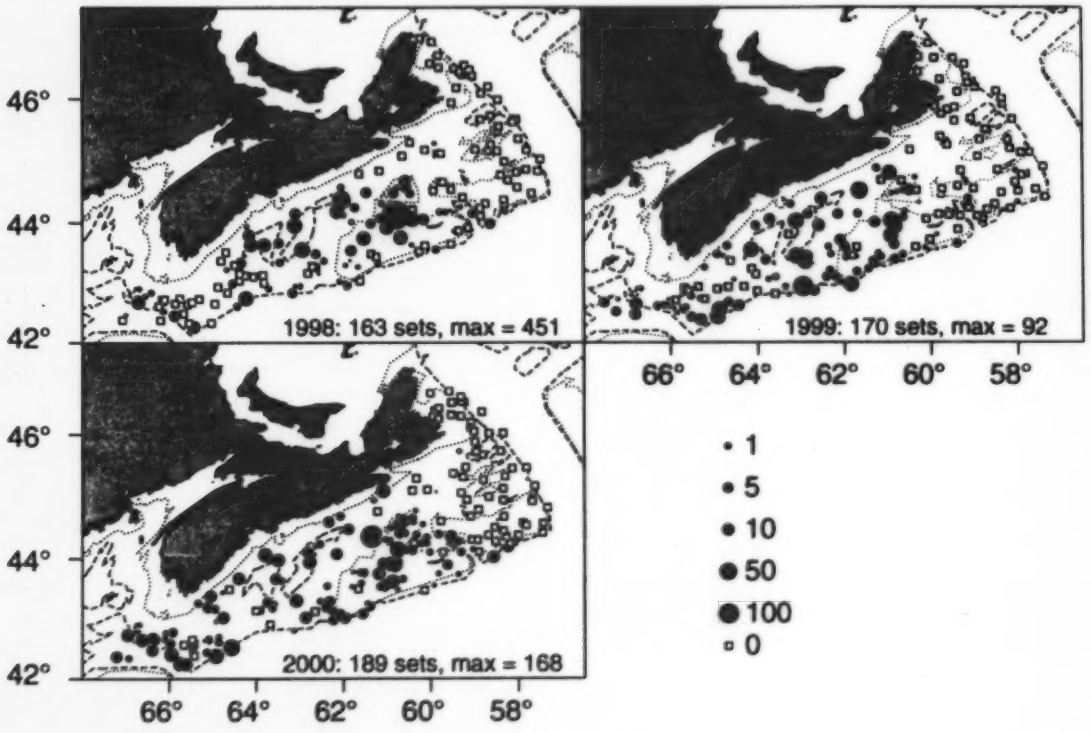

Fig. 71. 4VWX-484/495 Silver Hake Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

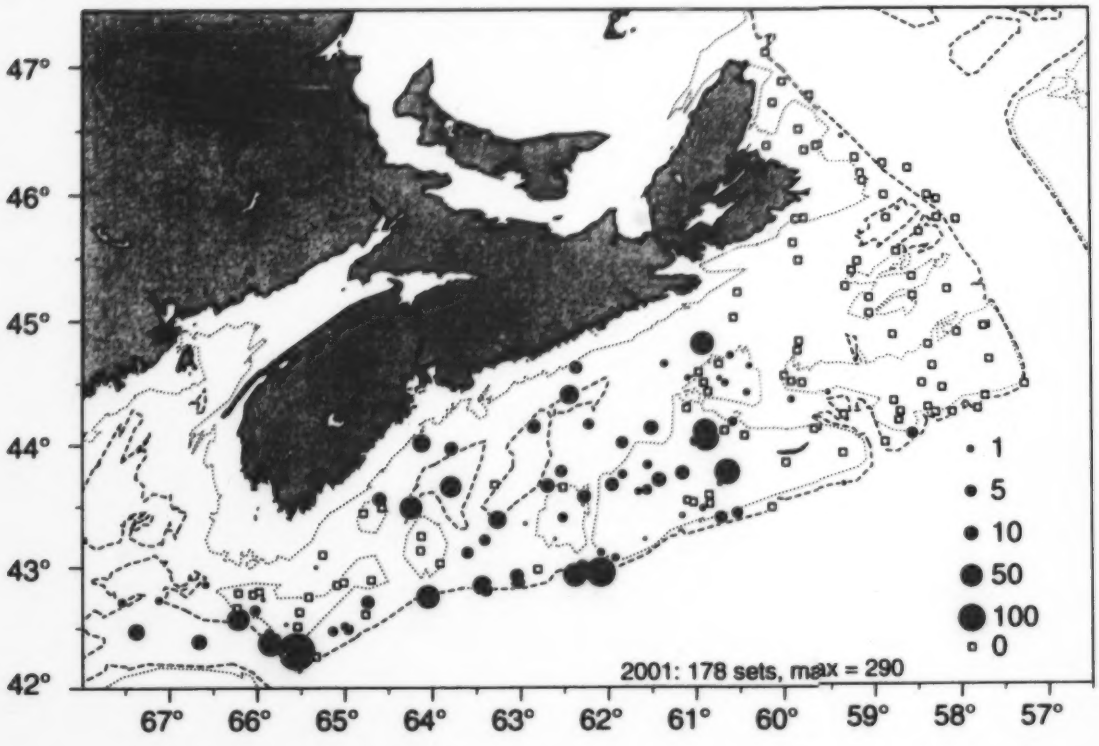

Fig. 72. 4VWX-484/495 Silver Hake Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

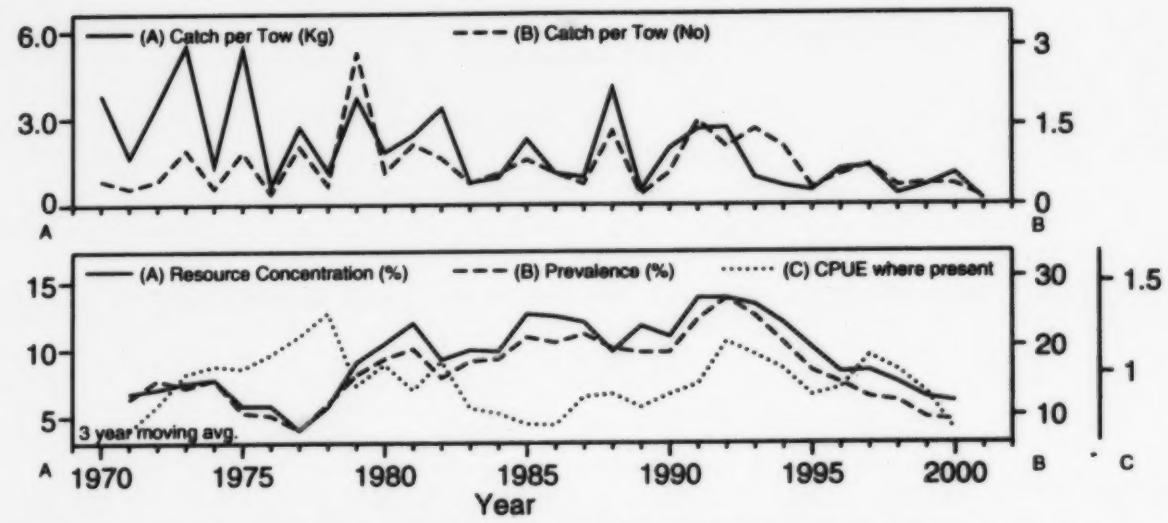

Fig. 73. 4VsW Winter Skate stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

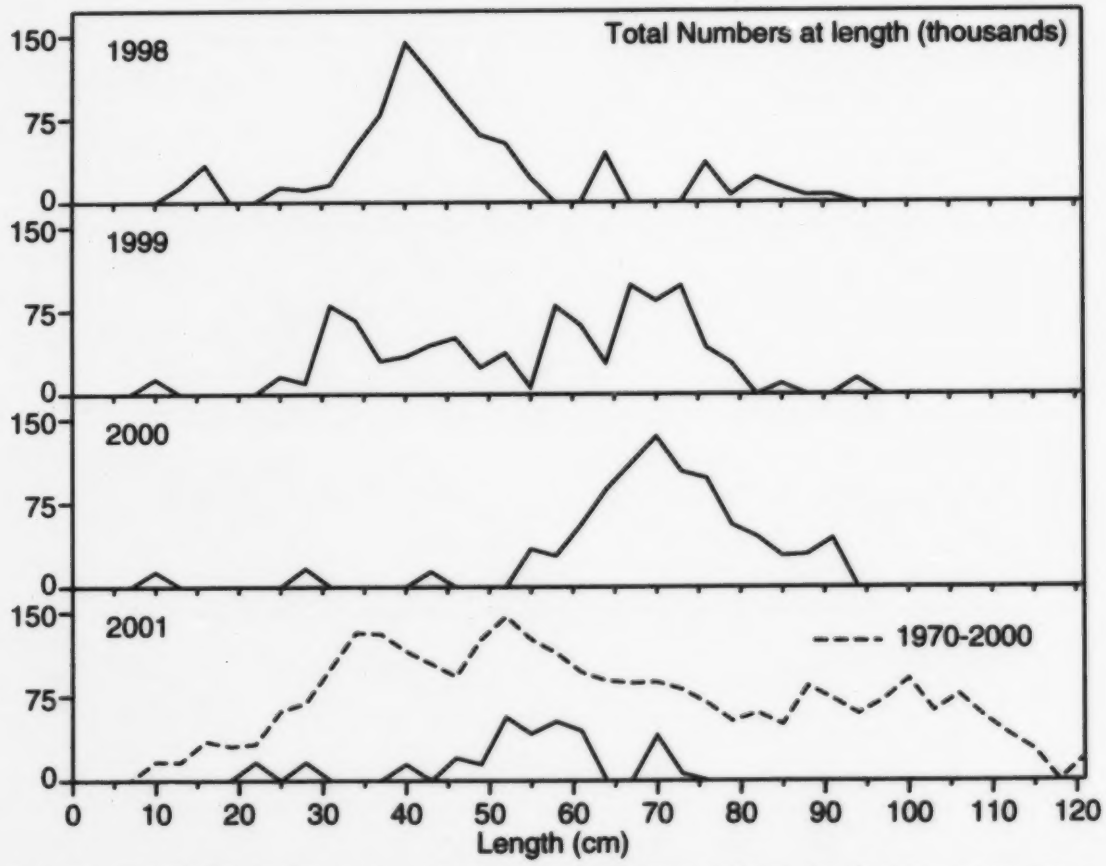

Fig. 74. 4VsW Winter Skate length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

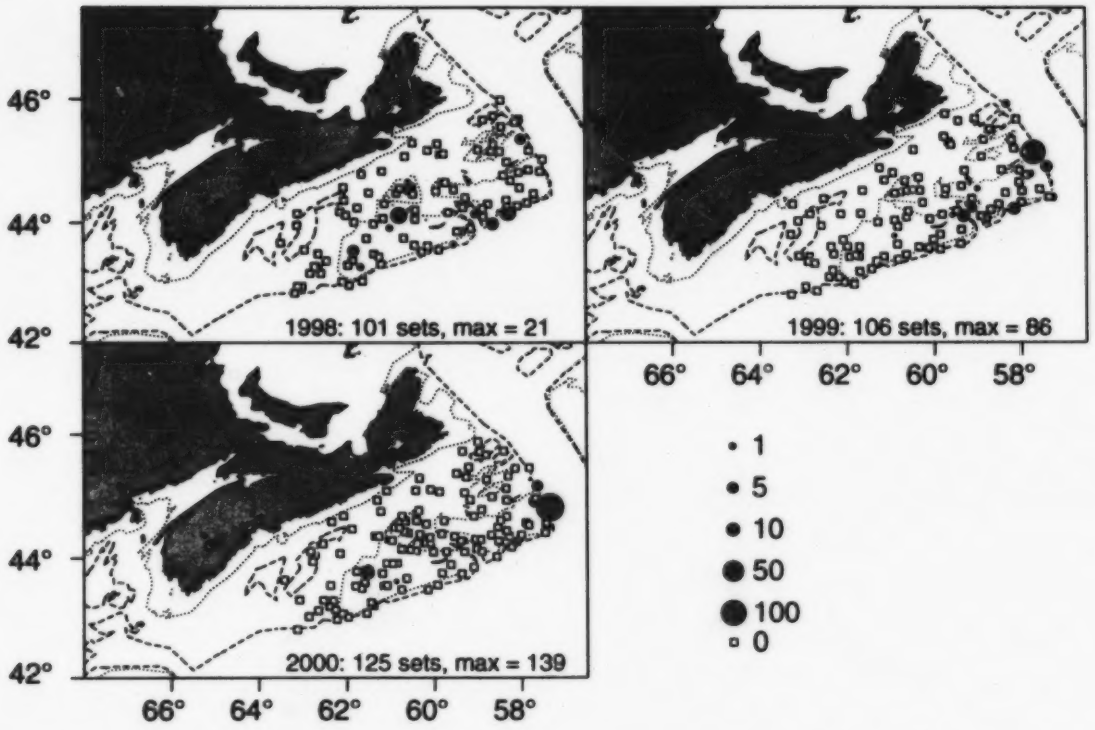

Fig. 75. 4VsW Winter Skate Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

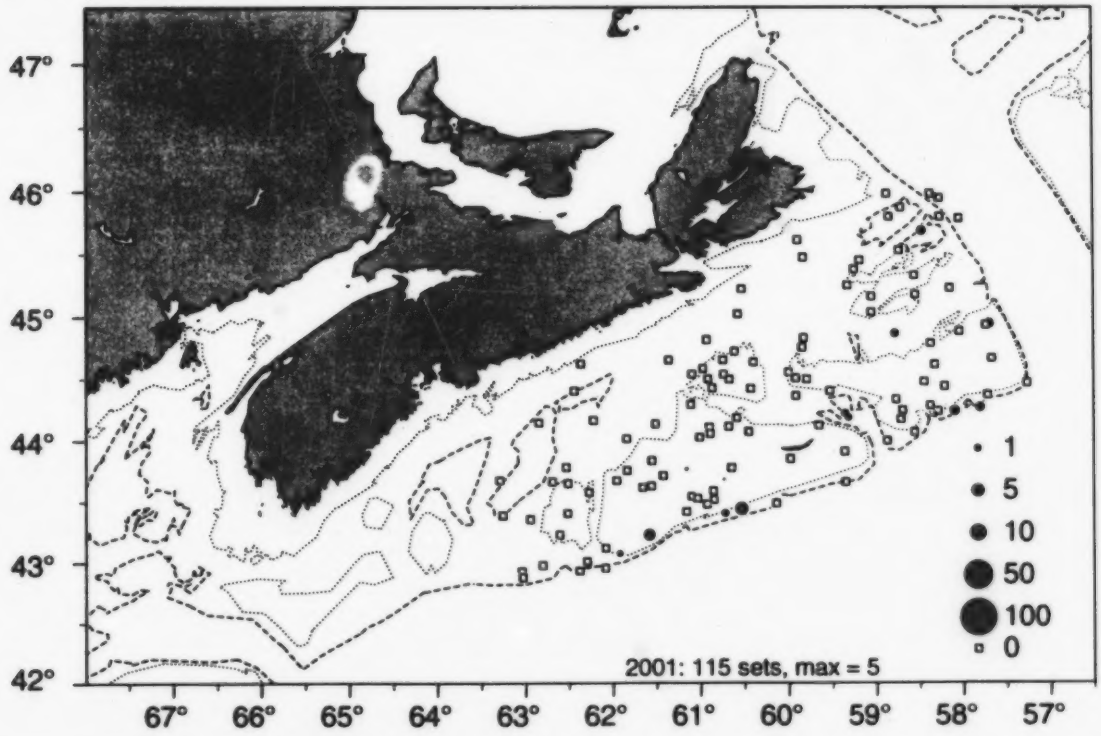

Fig. 76. 4VsW Winter Skate Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

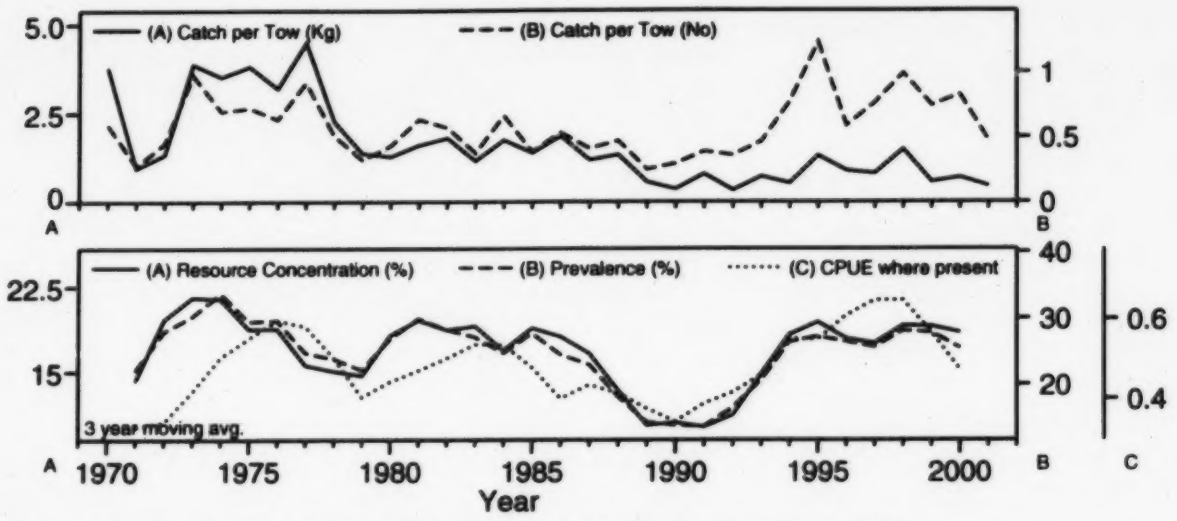

Fig. 77. 4VWX Monkfish stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

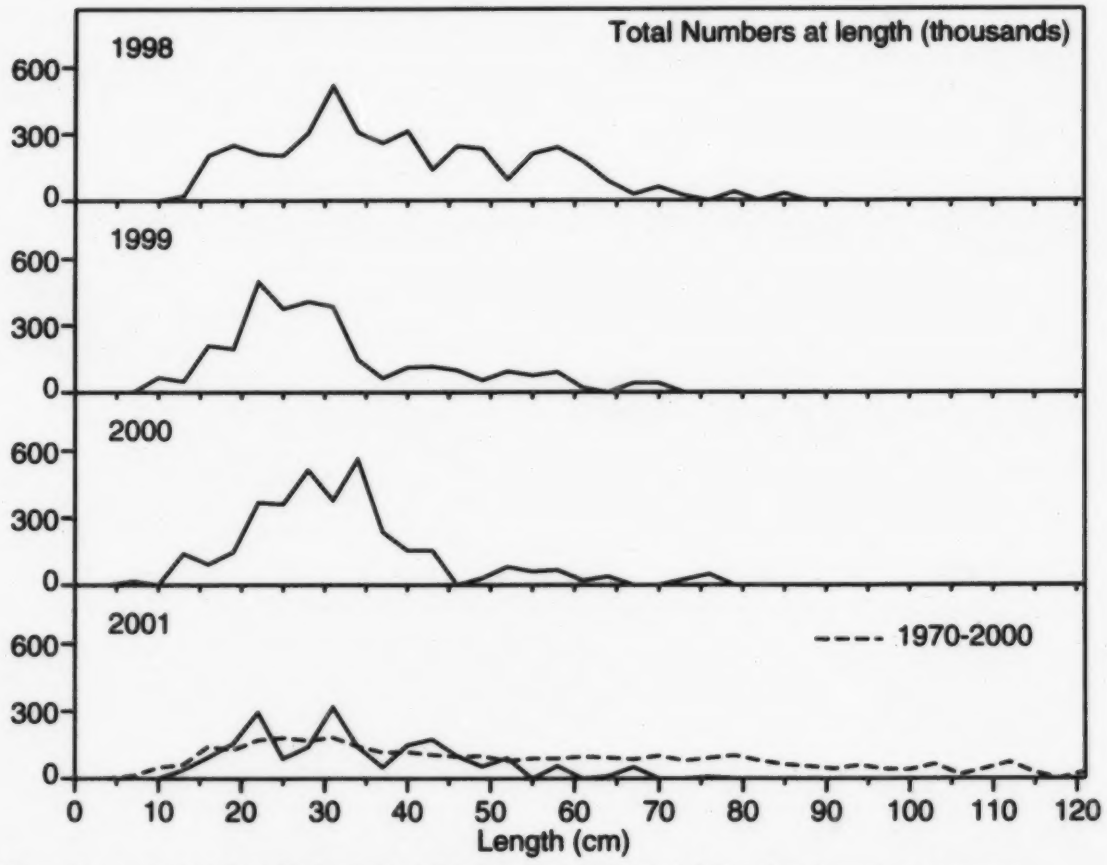

Fig. 78. 4VWX Monkfish length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

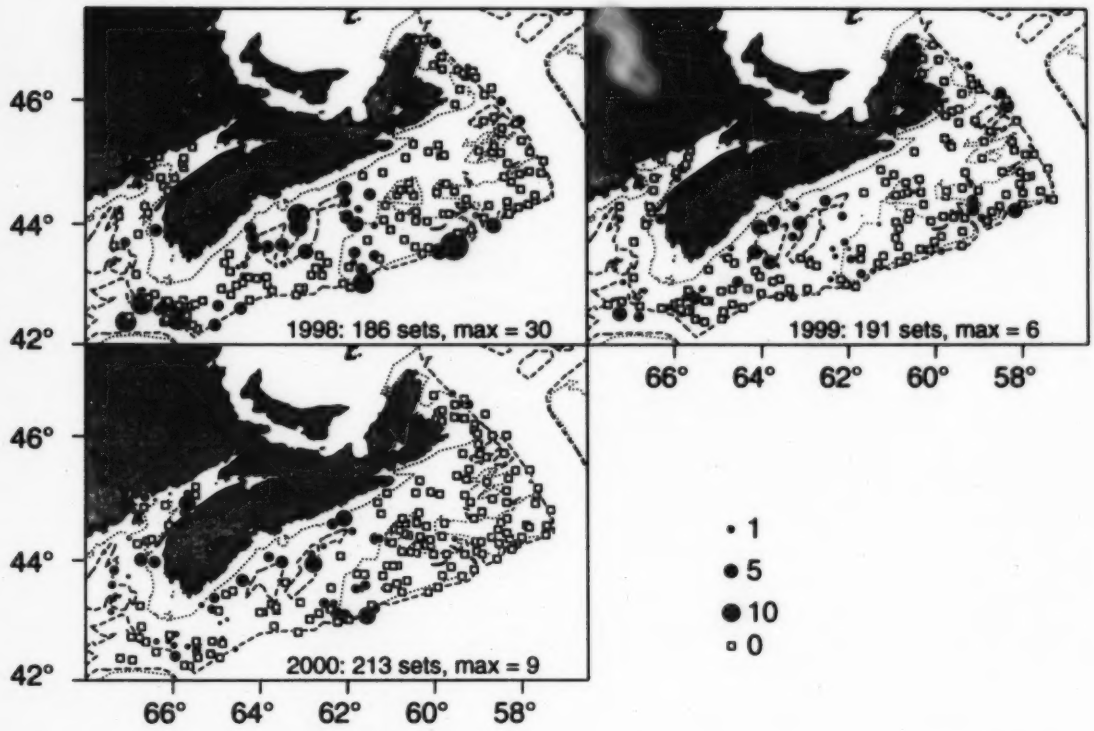

Fig. 79. 4VWX Monkfish Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

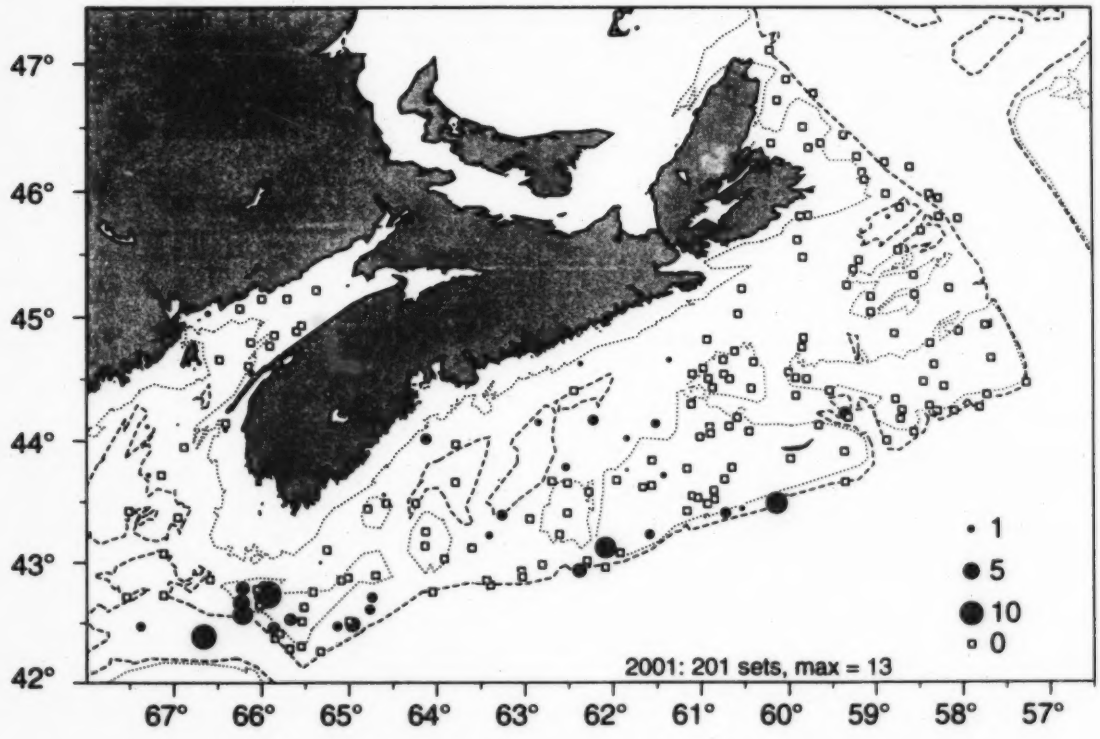

Fig. 80. 4VWX Monkfish Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

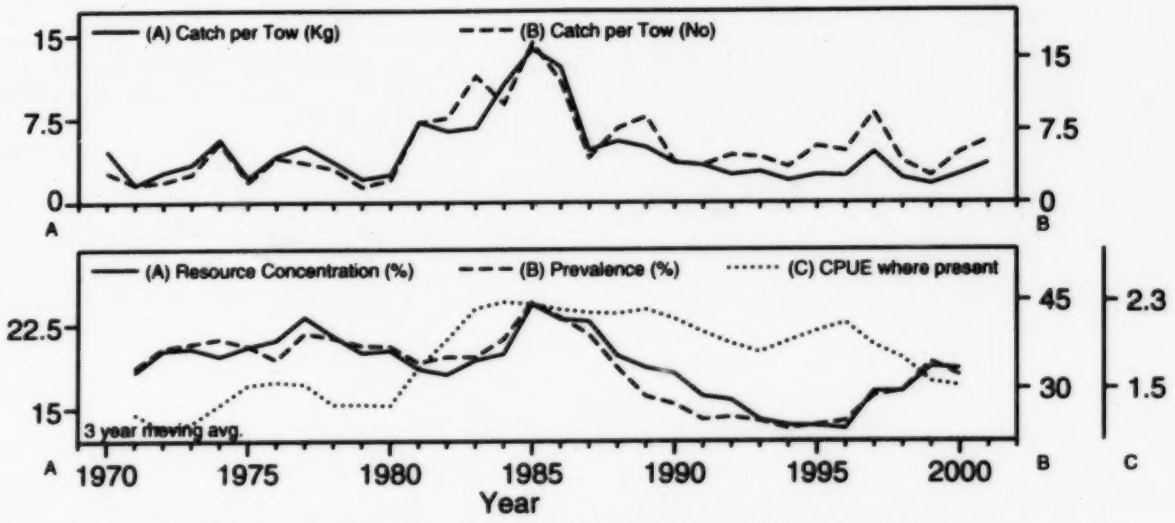

Fig. 81. 4VW White Hake stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

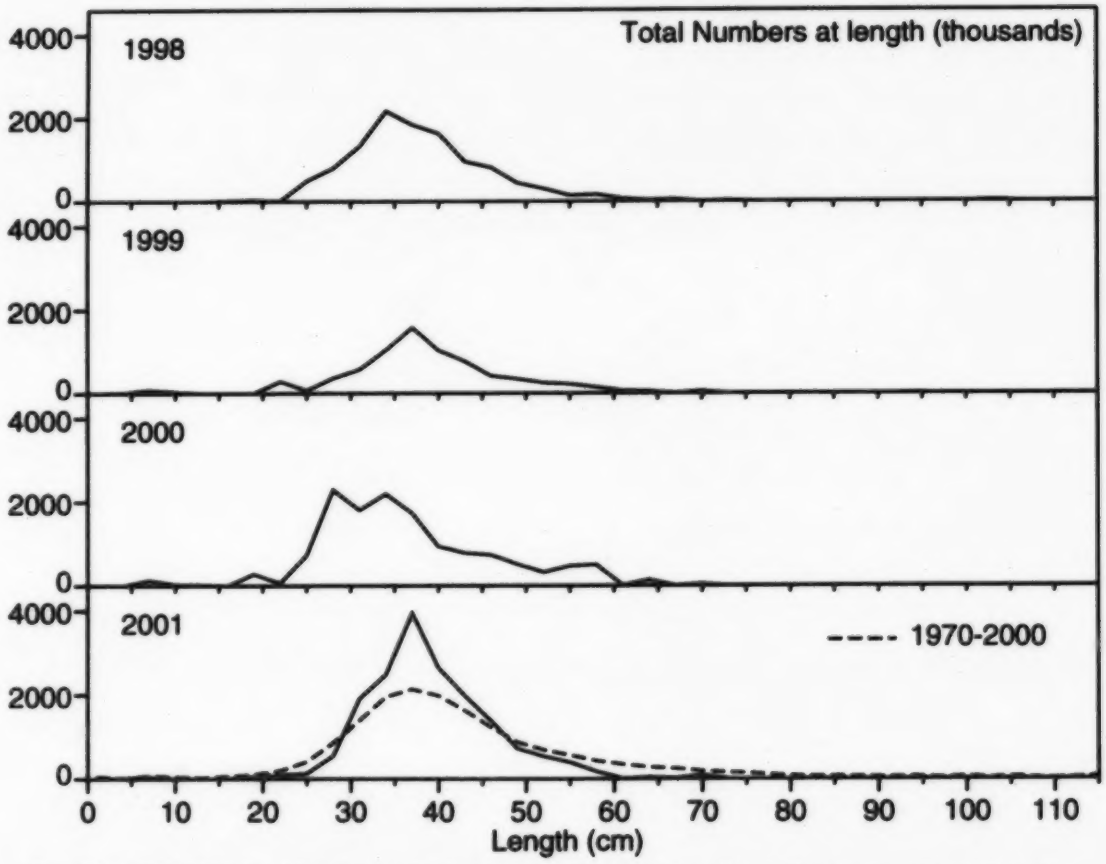

Fig. 82. 4VW White Hake length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

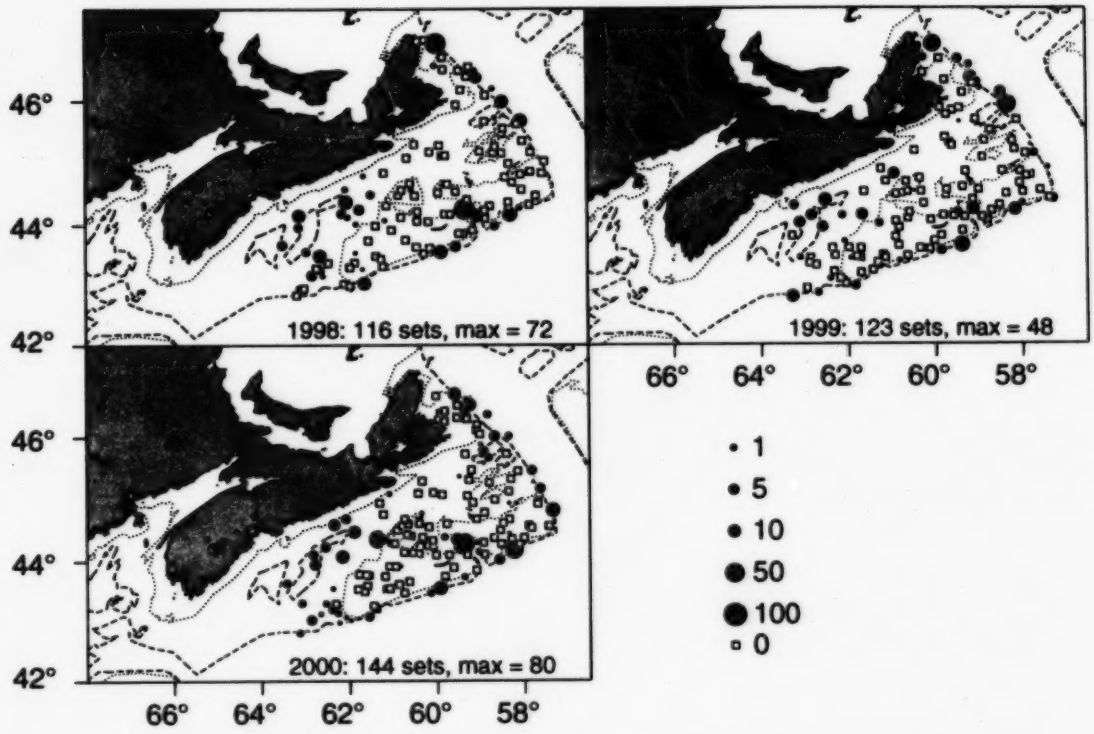

Fig. 83. 4VW White Hake Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

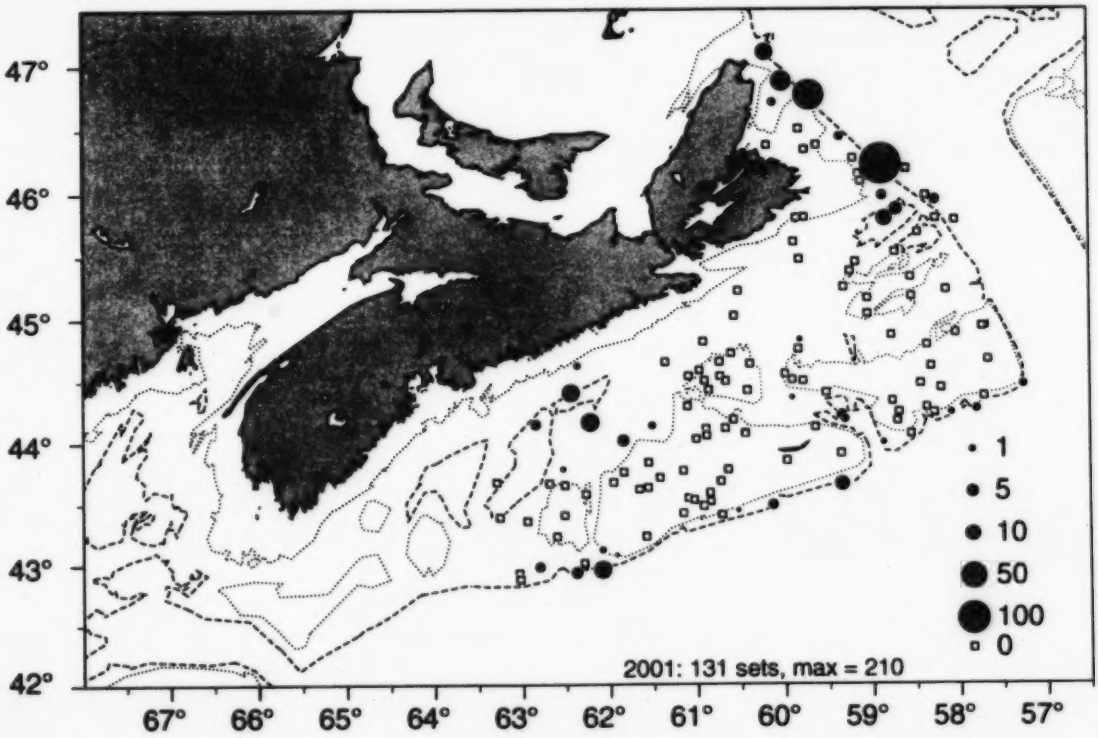

Fig. 84. 4VW White Hake Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

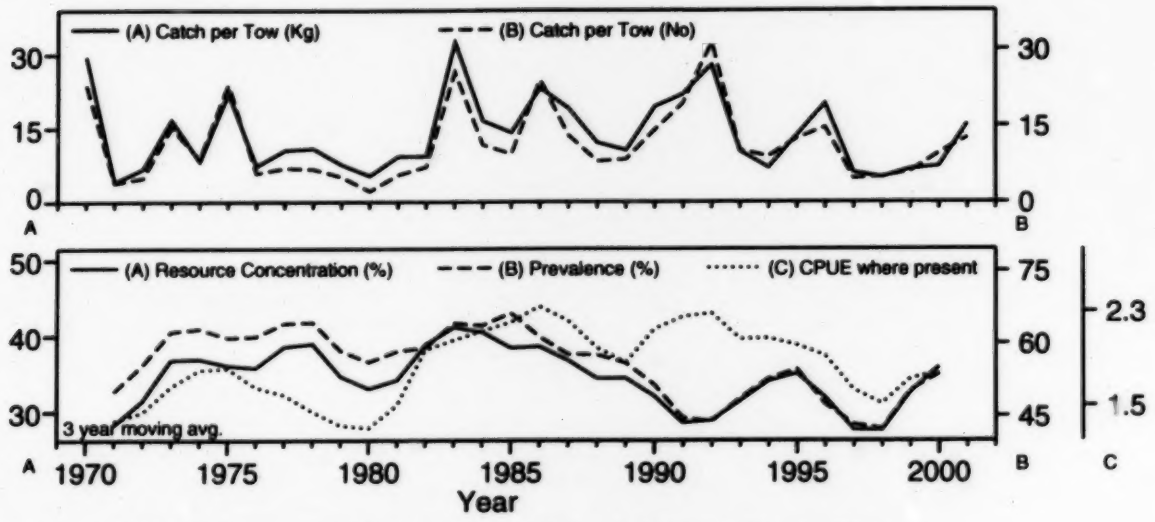

Fig. 85. 4X White Hake stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

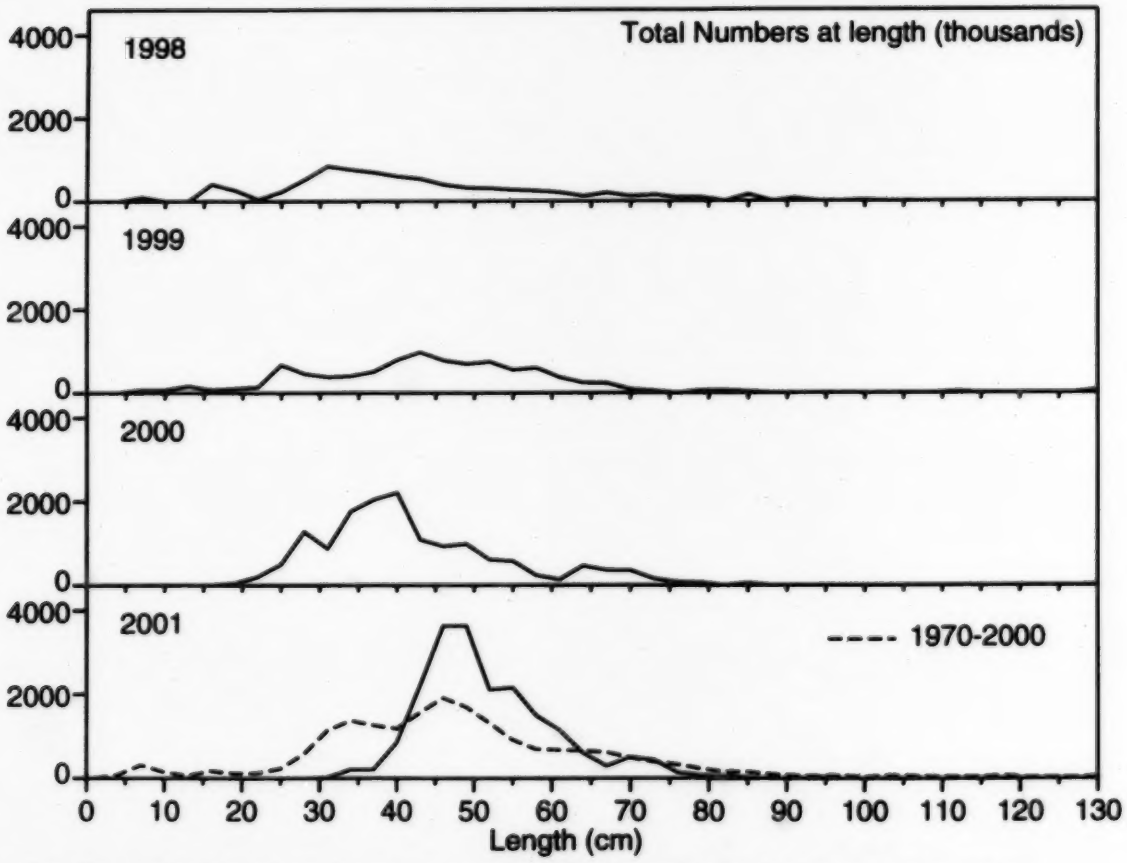

Fig. 86. 4X White Hake length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

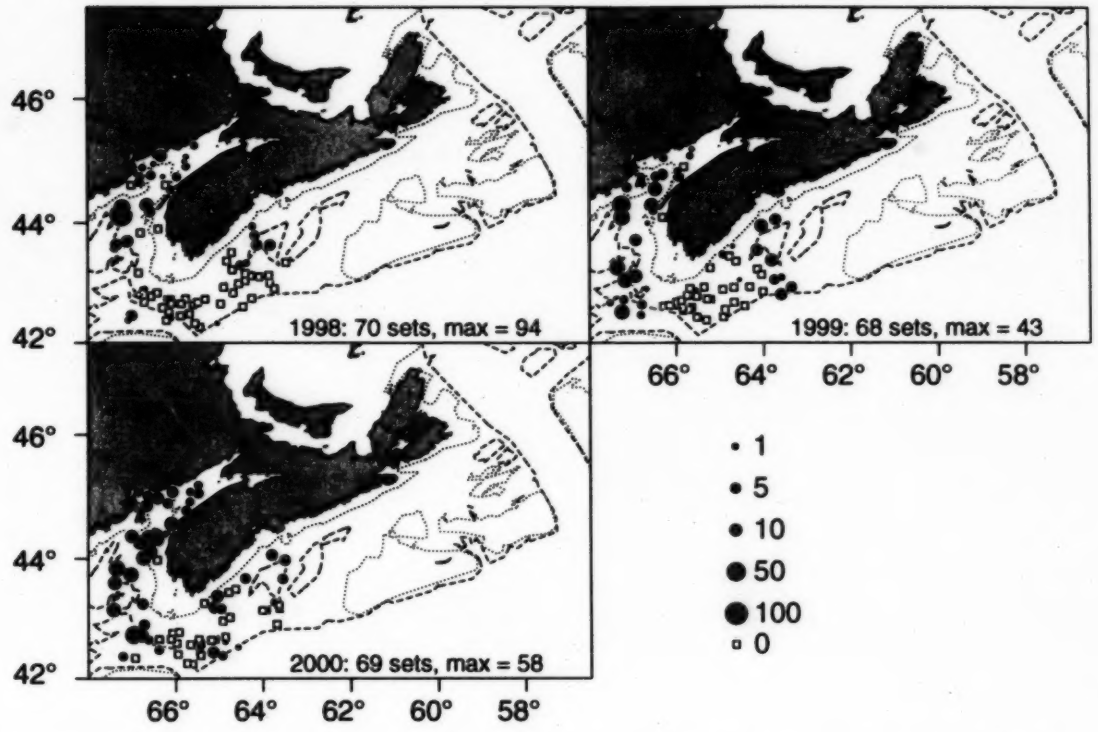

Fig. 87. 4X White Hake Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

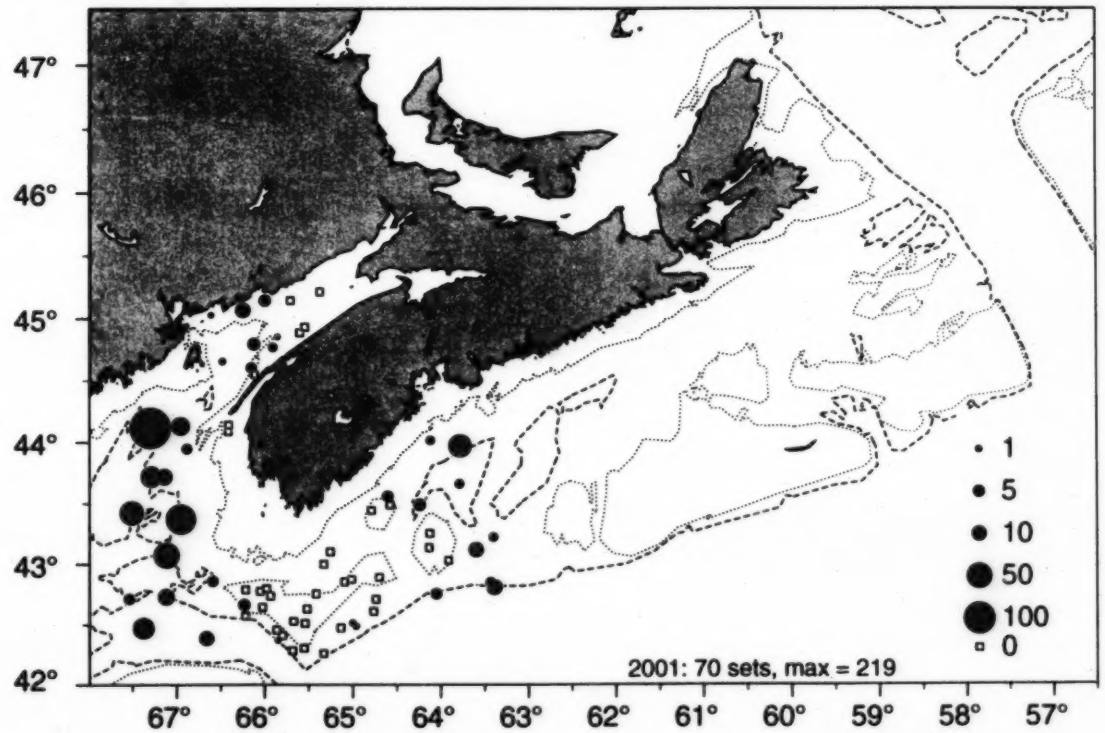

Fig. 88. 4X White Hake Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

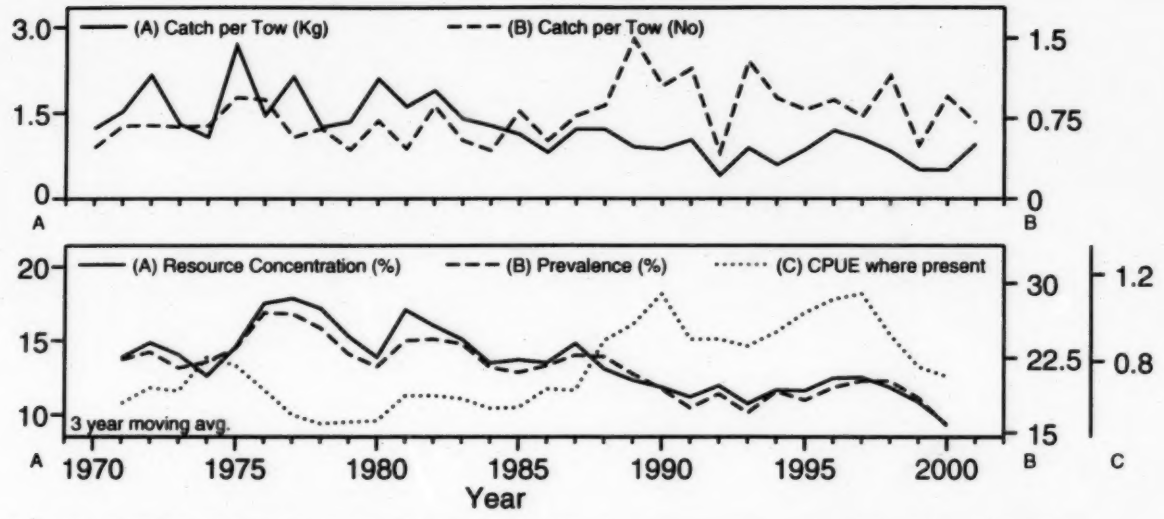

Fig. 89. 4VWX Striped Atlantic Wolffish stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

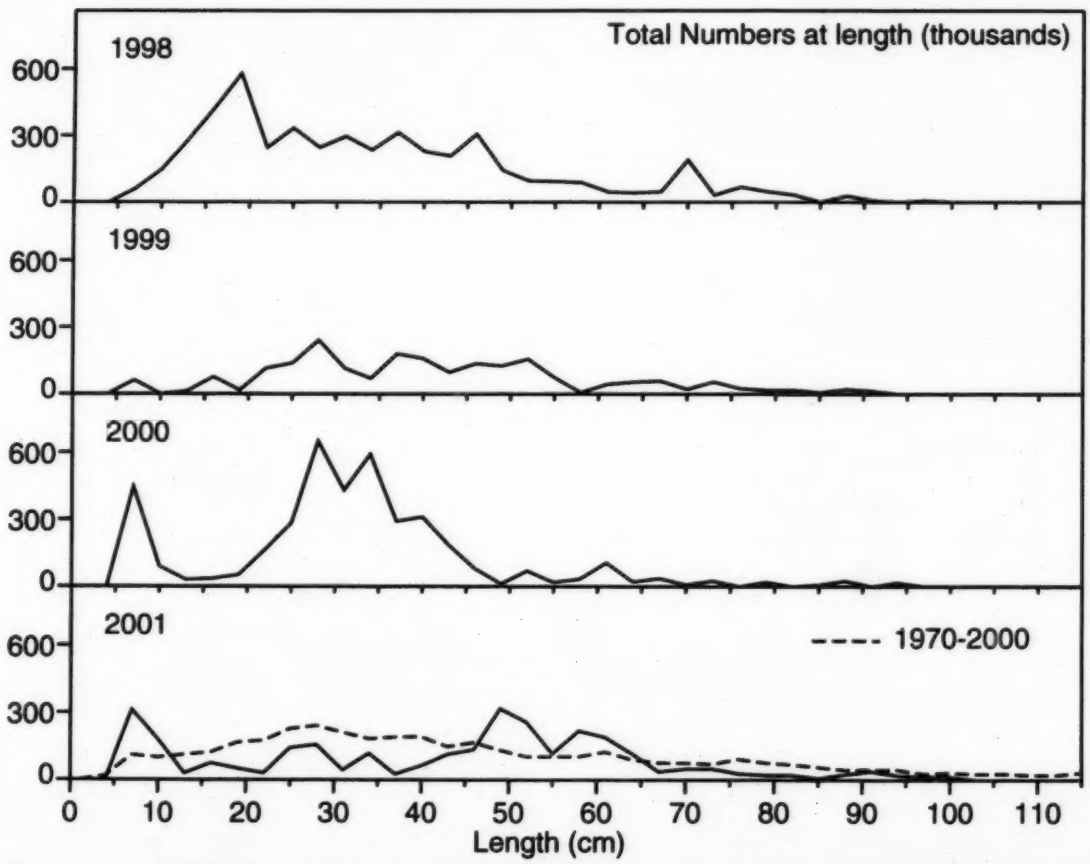

Fig. 90. 4VWX Striped Atlantic Wolffish length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

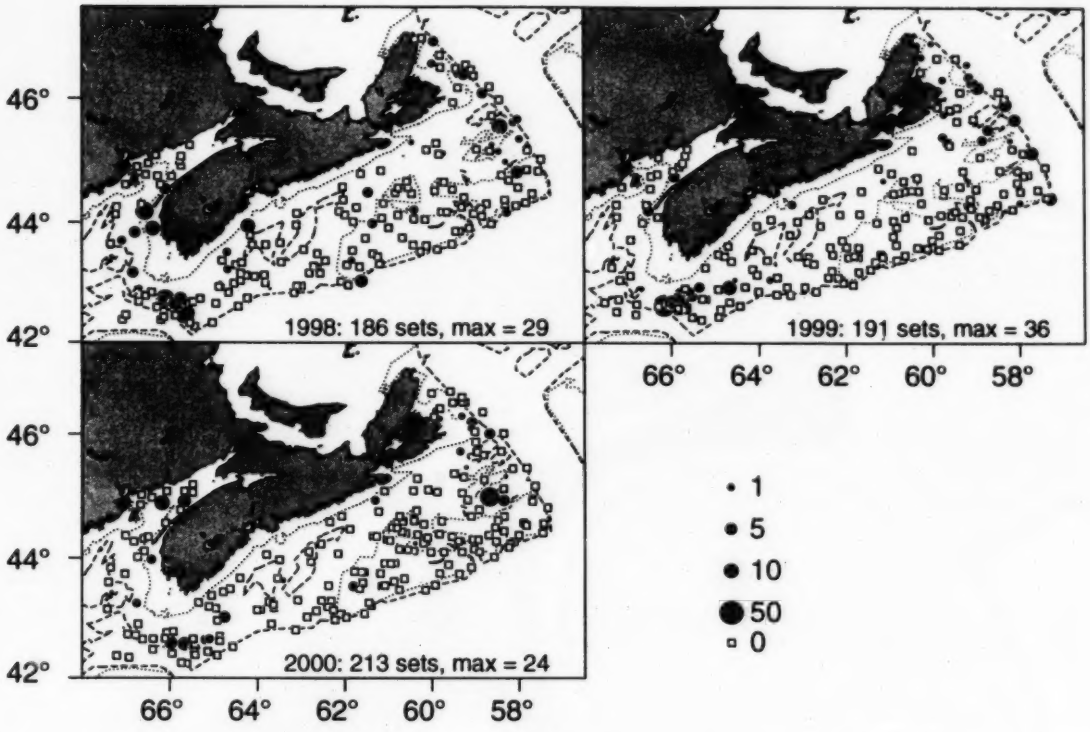

Fig. 91. 4VWX Striped Atlantic Wolffish Biomass (kg/tow) from the 1998-2000 Summer Groundfish Surve

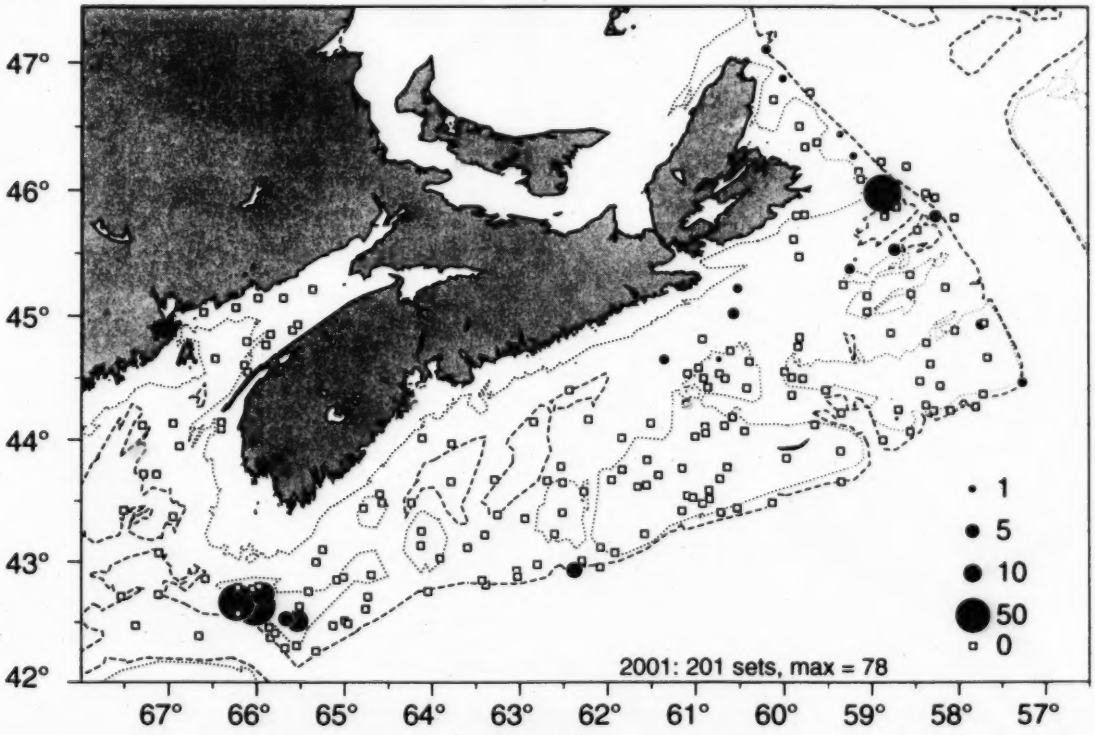

Fig. 92. 4VWX Striped Atlantic Wolffish Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

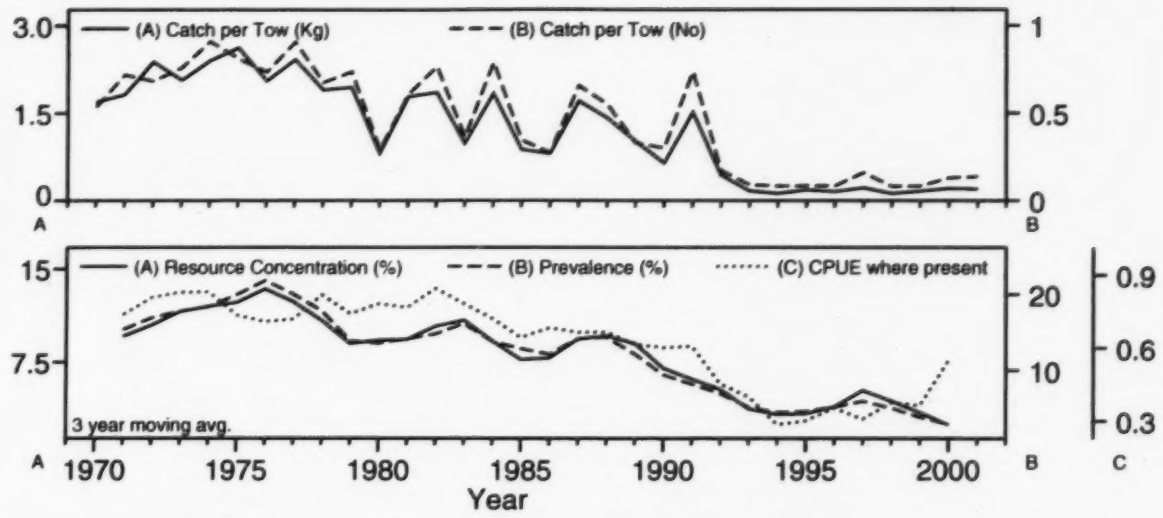

Fig. 93. 4VWX Cusk stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

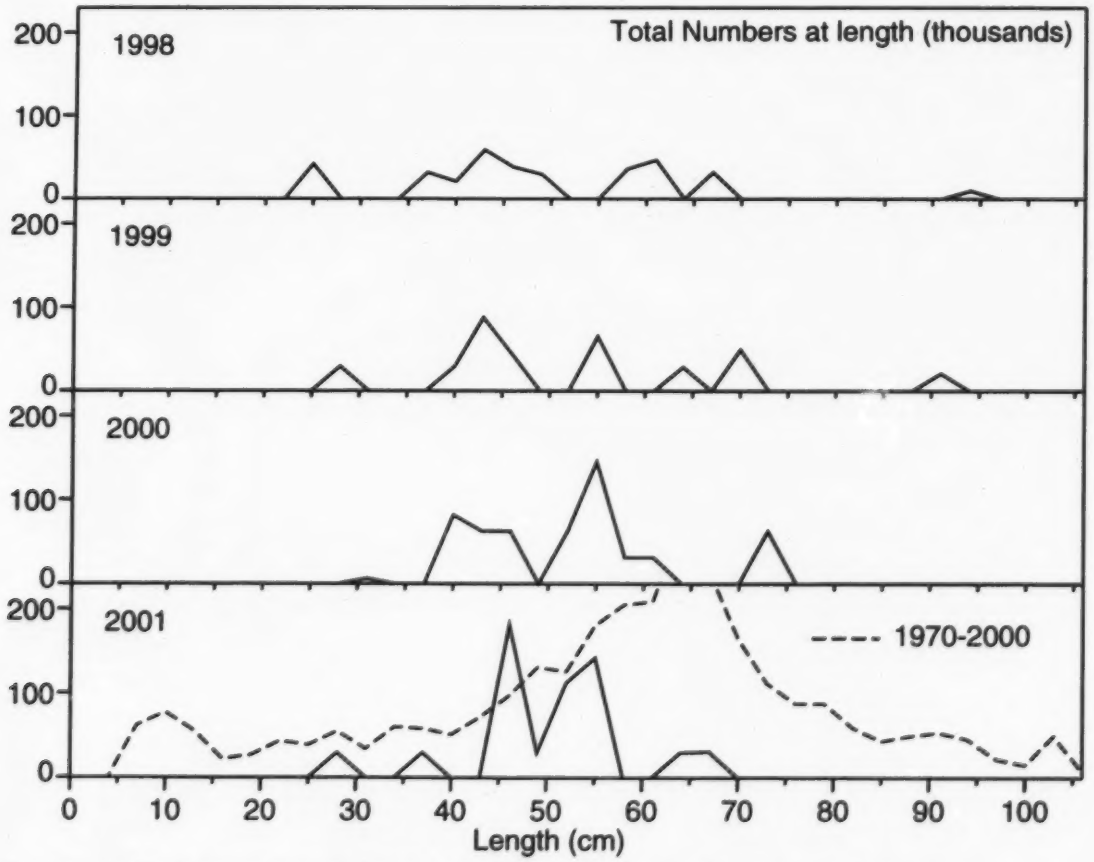

Fig. 94. 4VWX Cusk length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

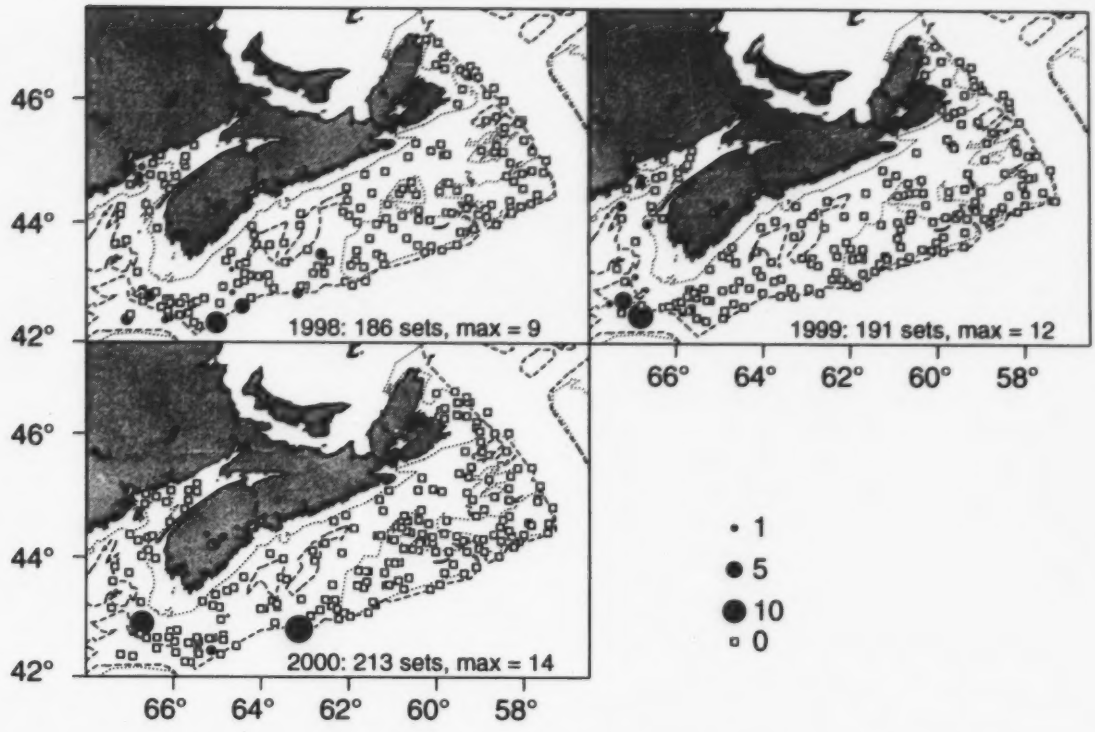

Fig. 95. 4VWX Cusk Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

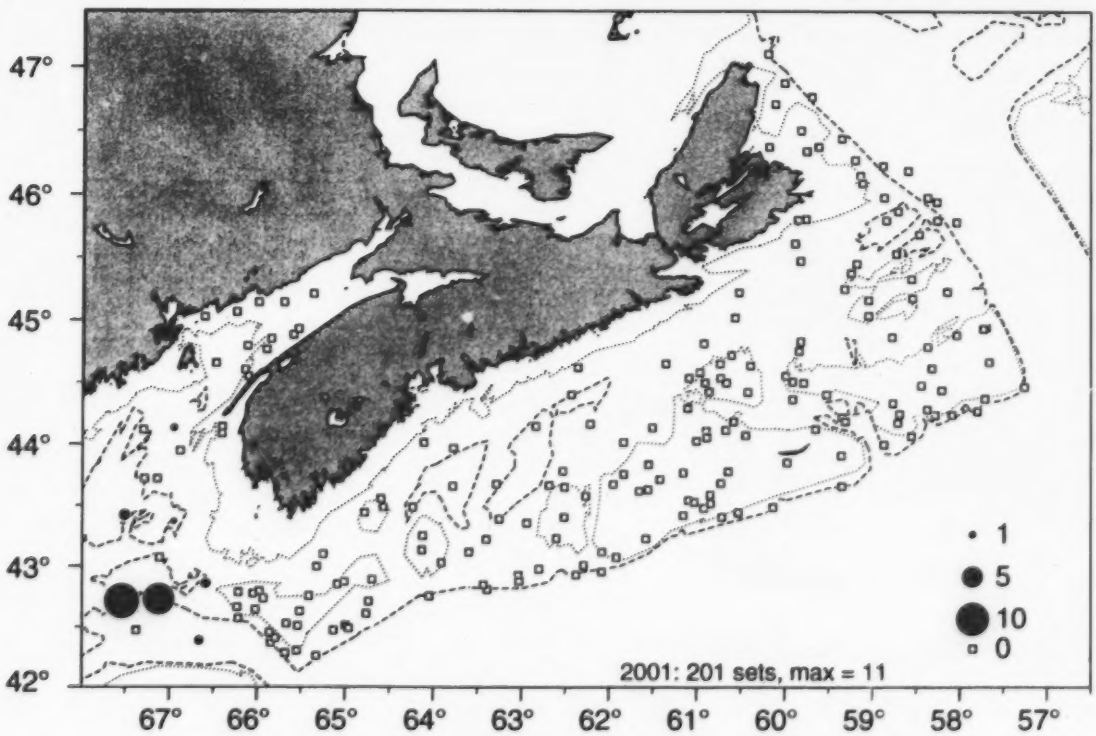

Fig. 96. 4VWX Cusk Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

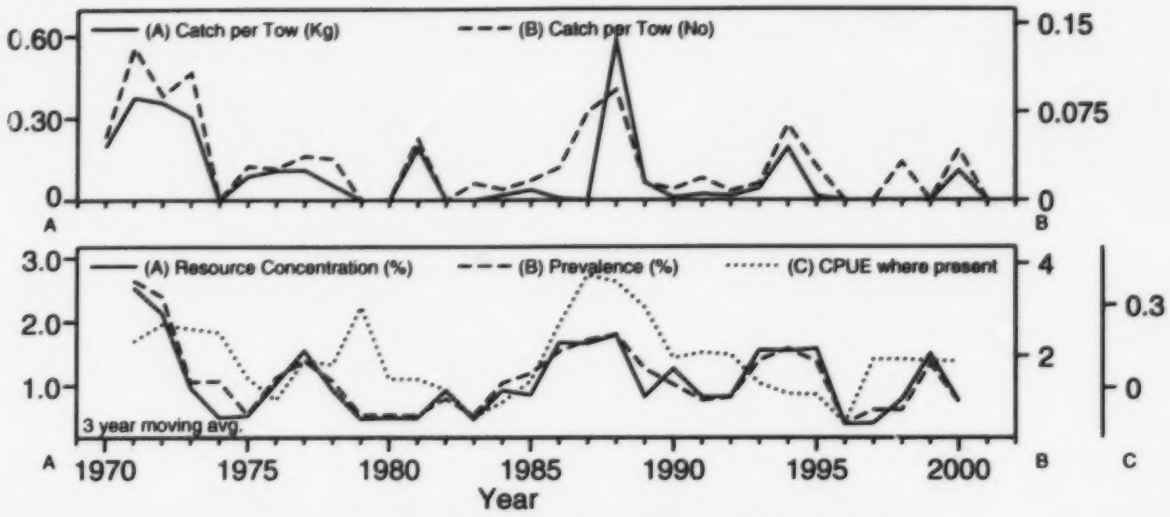

Fig. 97. 4VW Lumpfish stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

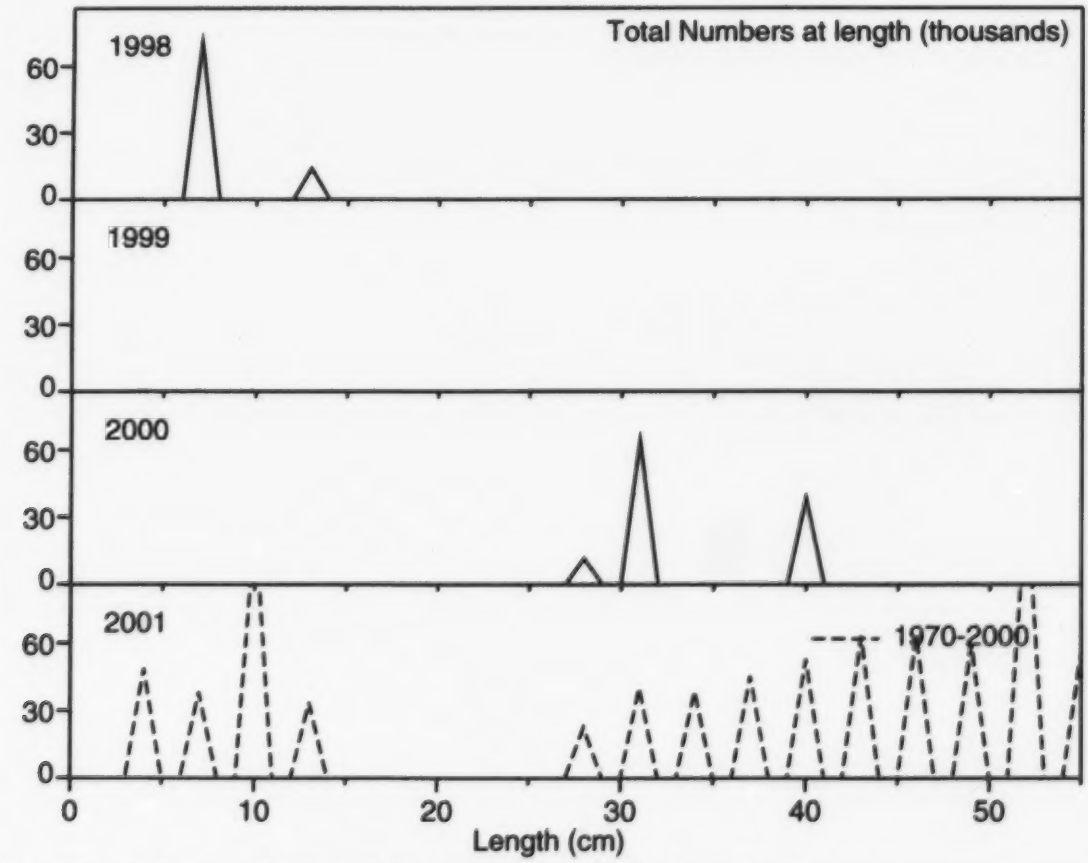

Fig. 98. 4VW Lumpfish length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

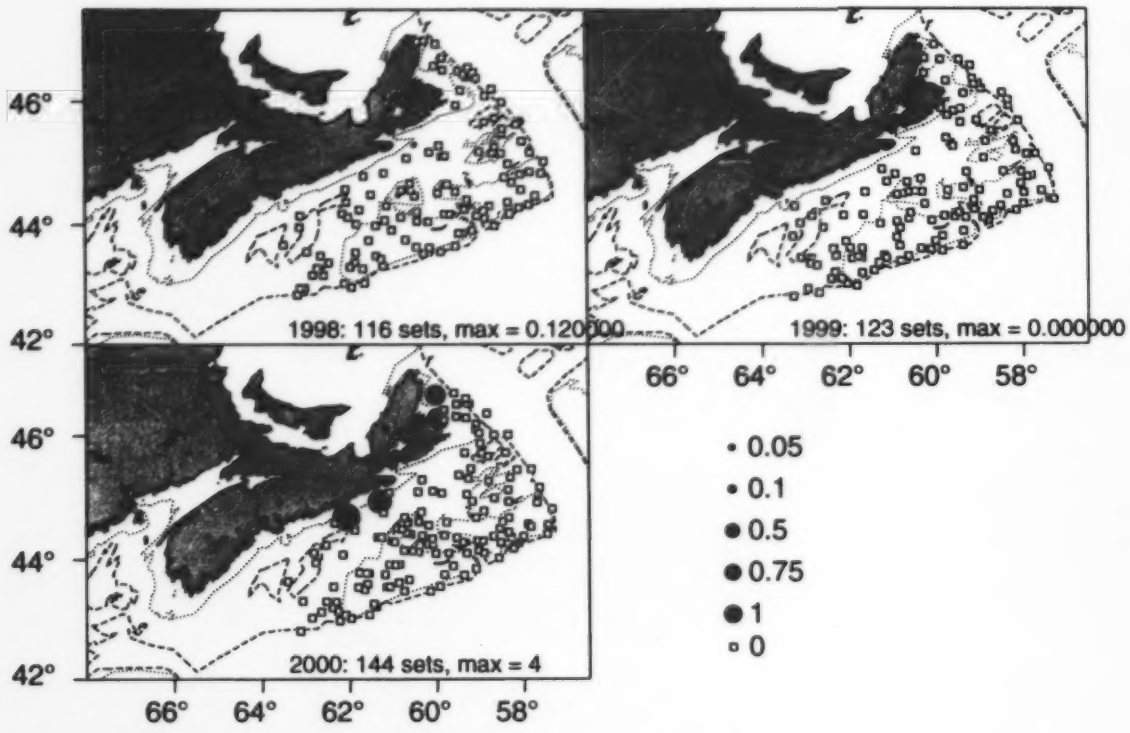

Fig. 99. 4VW Lumpfish Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

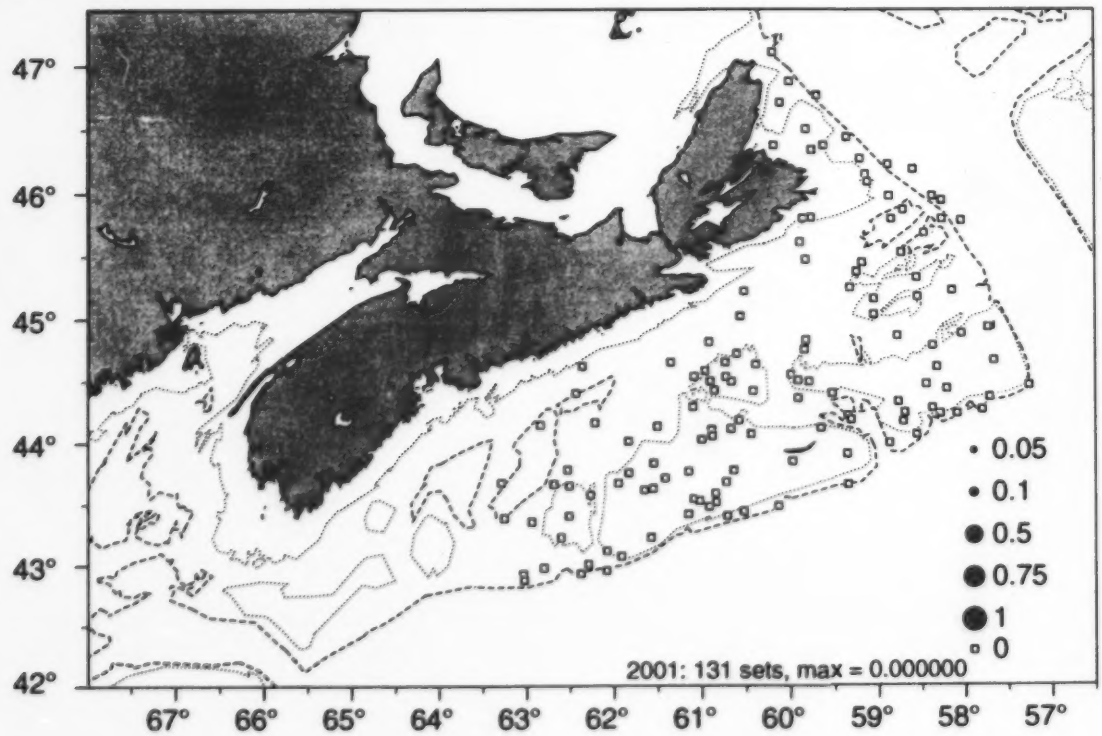

Fig. 100. 4VW Lumpfish Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

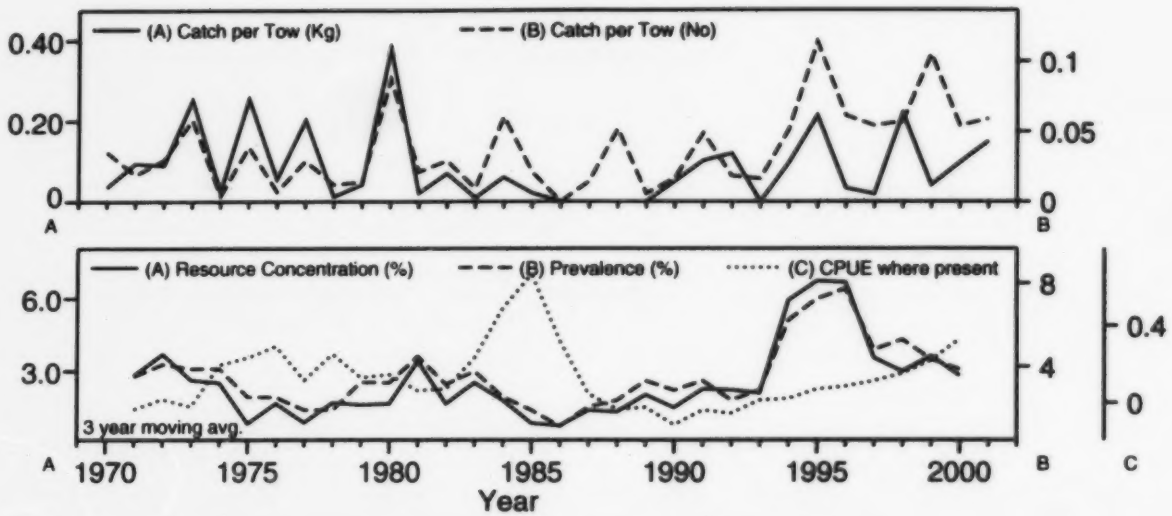

Fig. 101. 4X Lumpfish stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

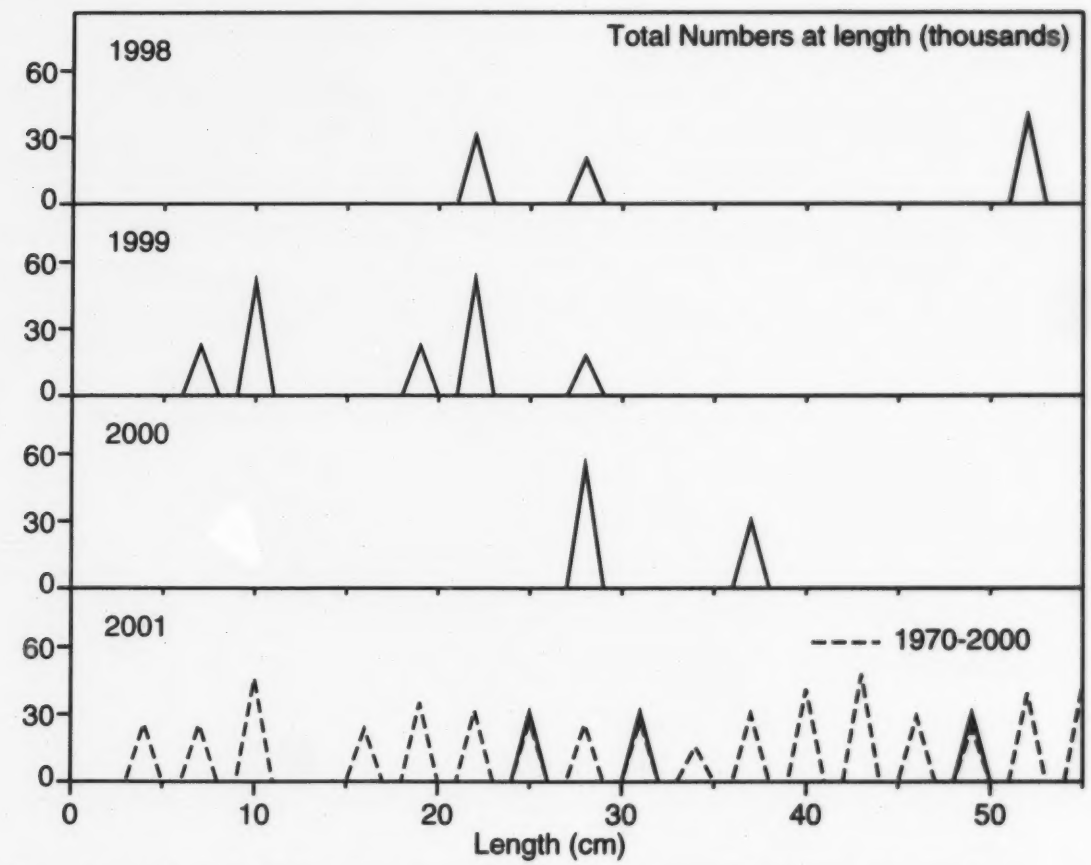

Fig. 102. 4X Lumpfish length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

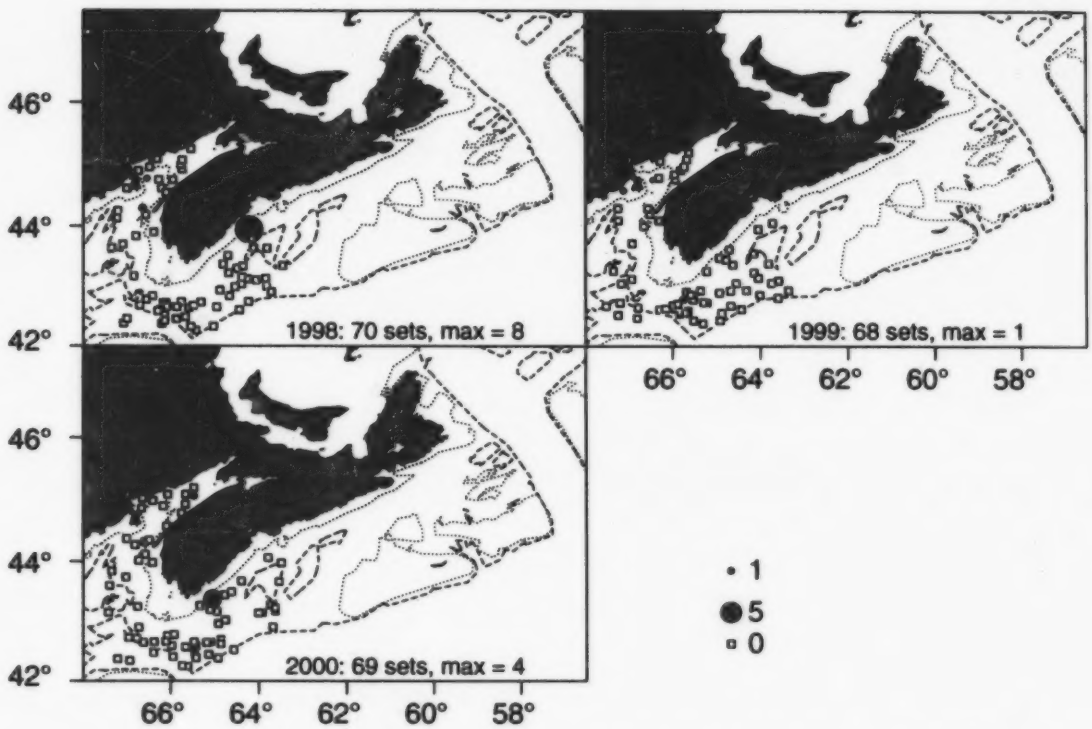

Fig. 103. 4X Lumpfish Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

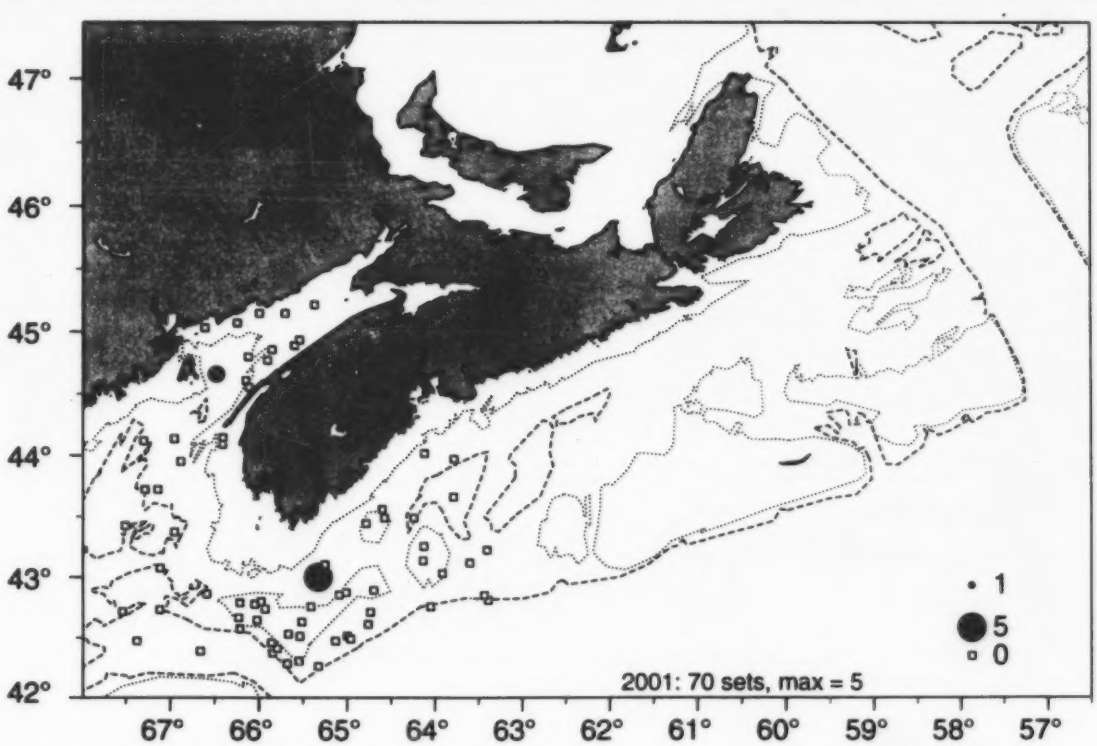

Fig. 104. 4X Lumpfish Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

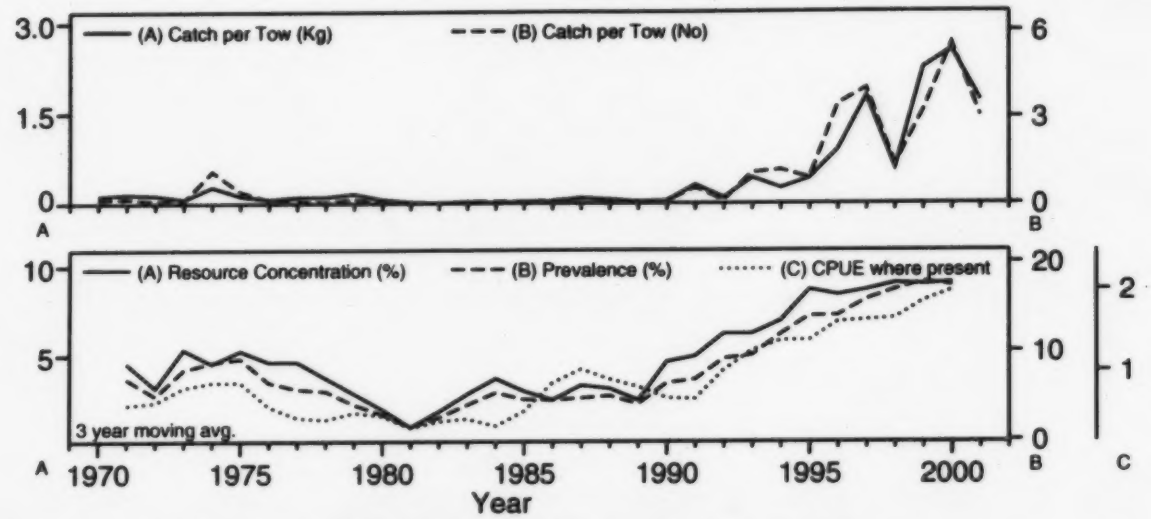

Fig. 105. 4VW Turbot stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

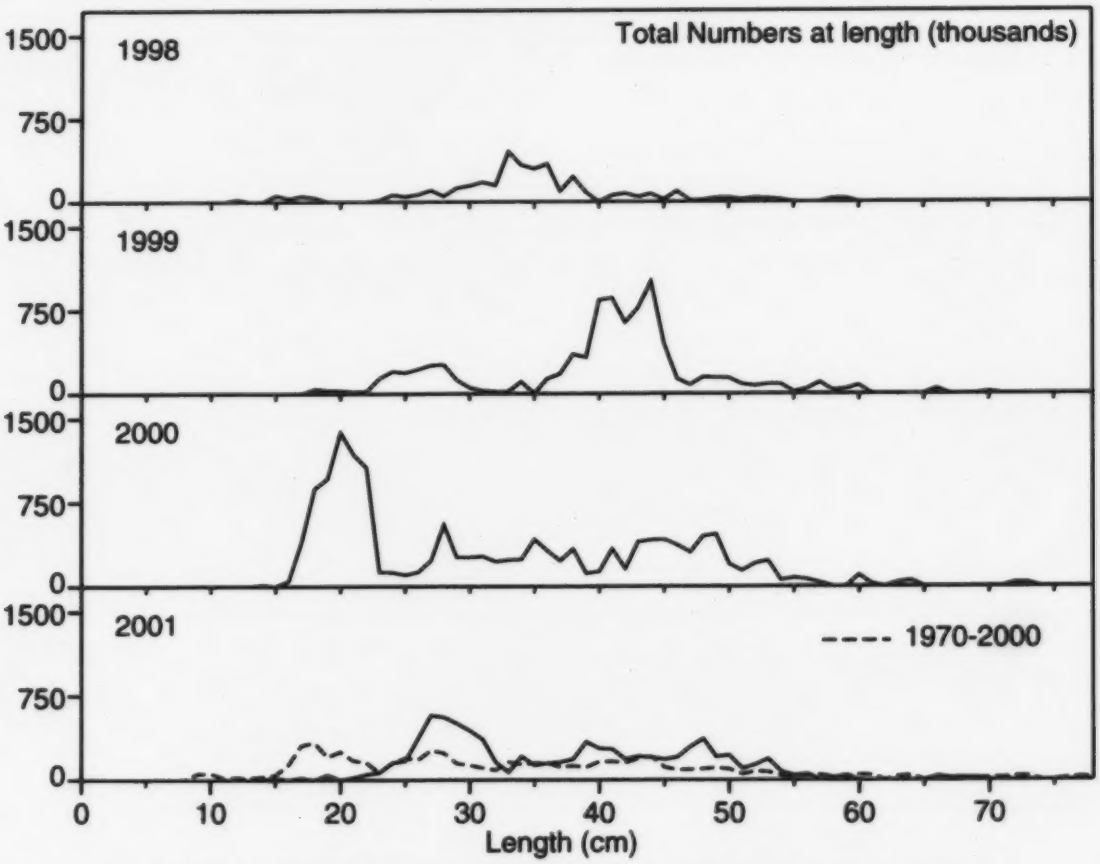

Fig. 106. 4VW Turbot length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

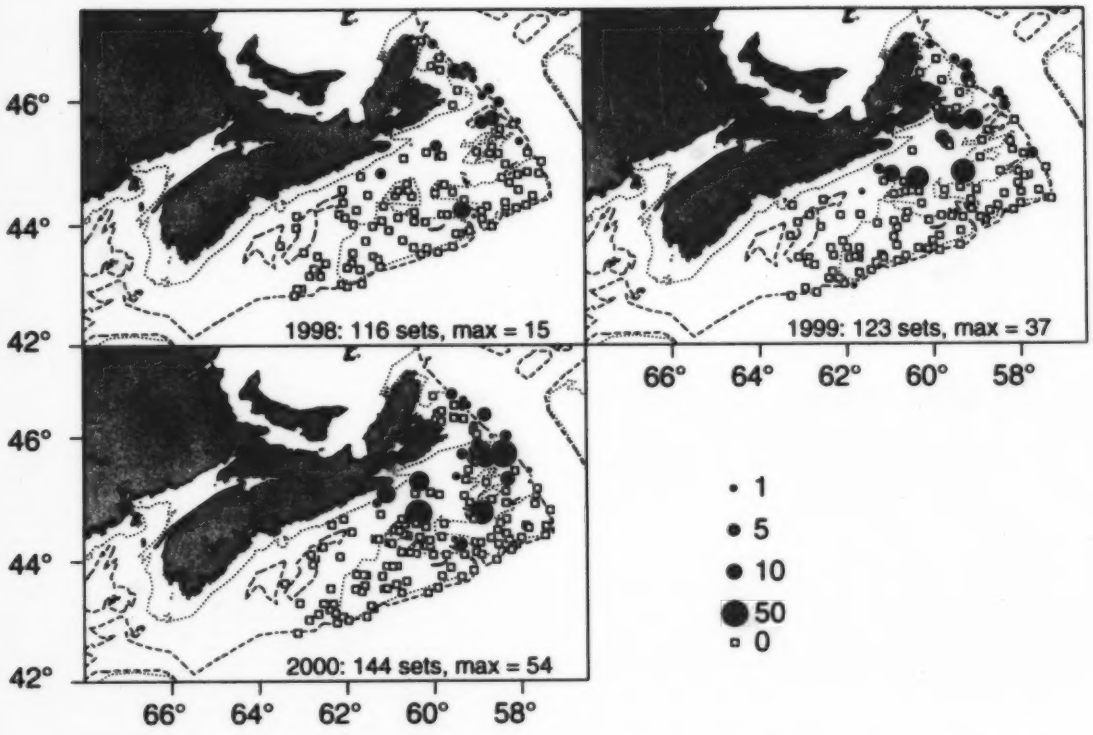

Fig. 107. 4VW Turbot Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

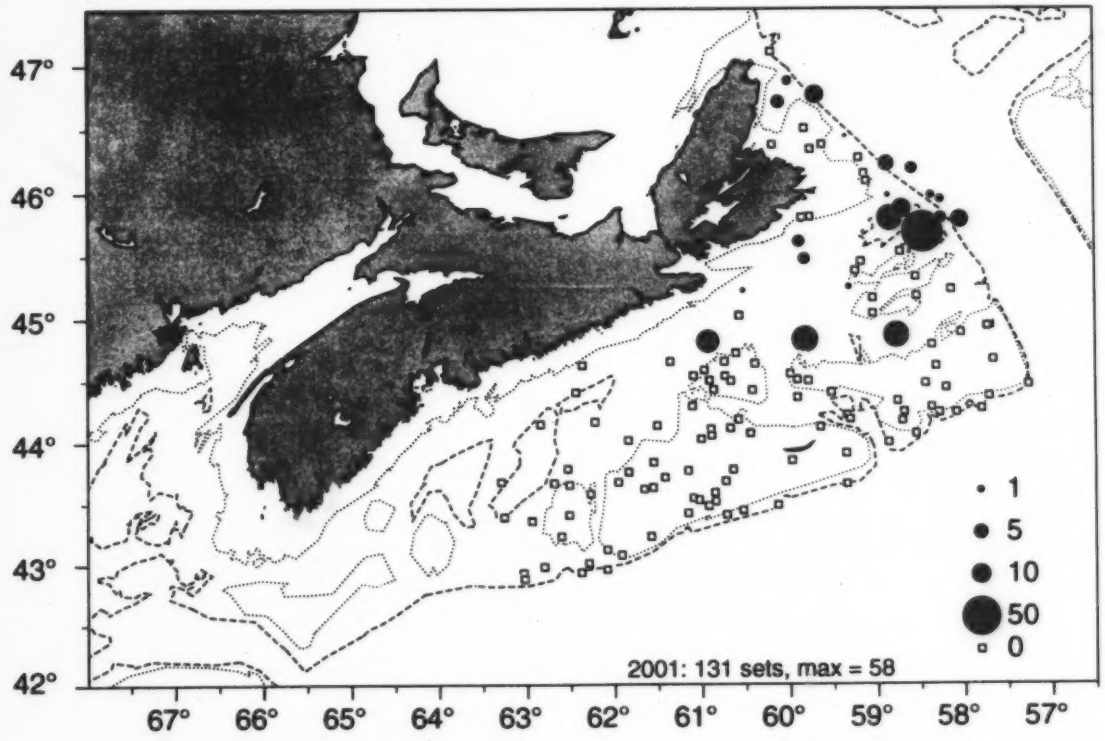

Fig. 108. 4VW Turbot Biomass (kg/tow) from the 2001 Summer Groundfish Survey.

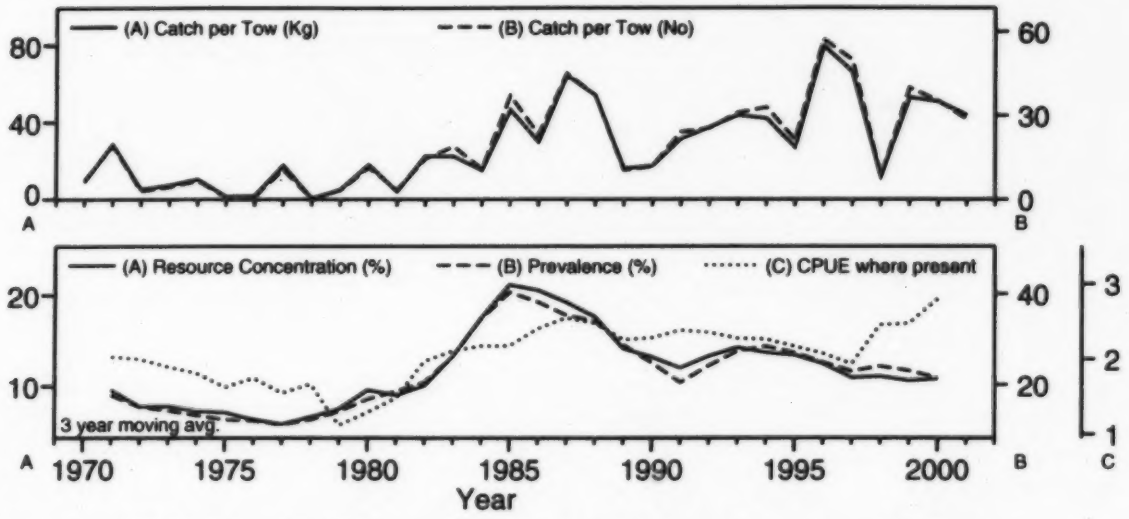

Fig. 109. 4VWX Spiny Dogfish stratified mean weight caught per tow, stratified mean number caught per tow, resource concentration, prevalence and CPUE where present (log number/tow) from the Summer surveys.

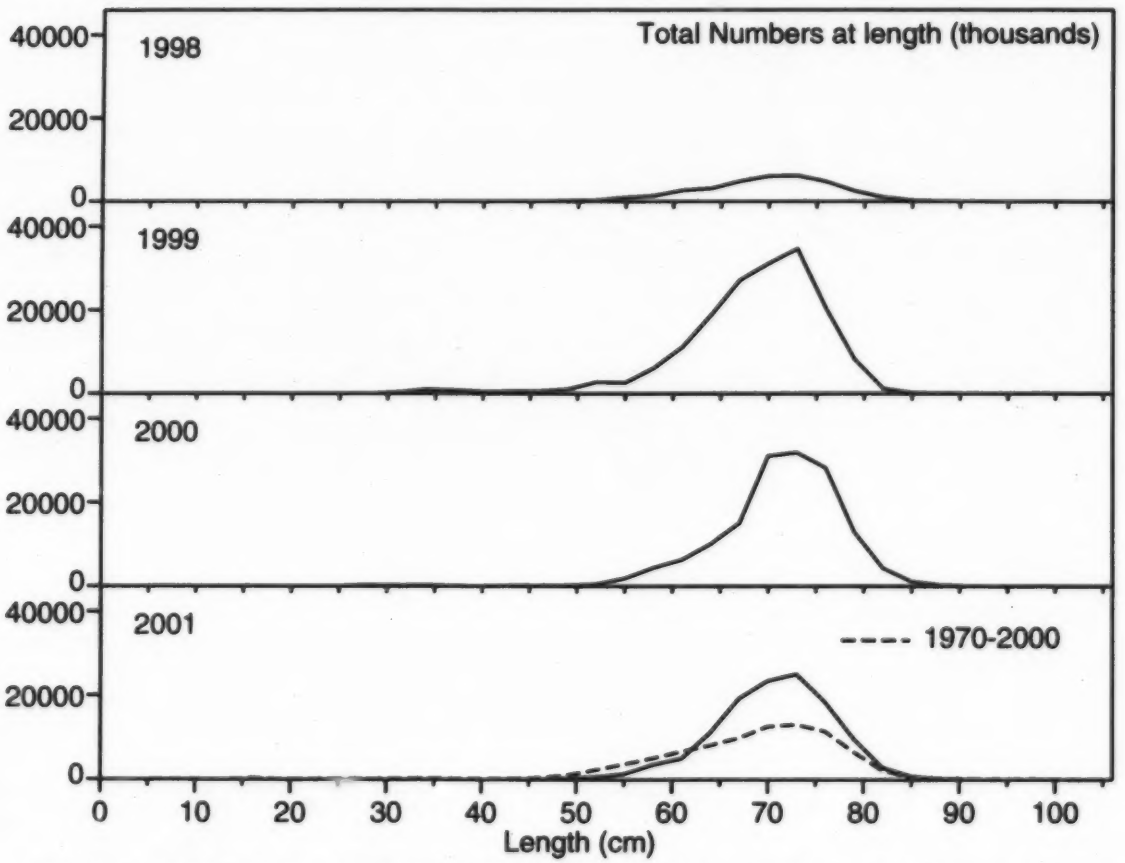

Fig. 110. 4VWX Spiny Dogfish length frequency distribution from the Summer surveys, with comparison to the 1970-2000 average in 2001.

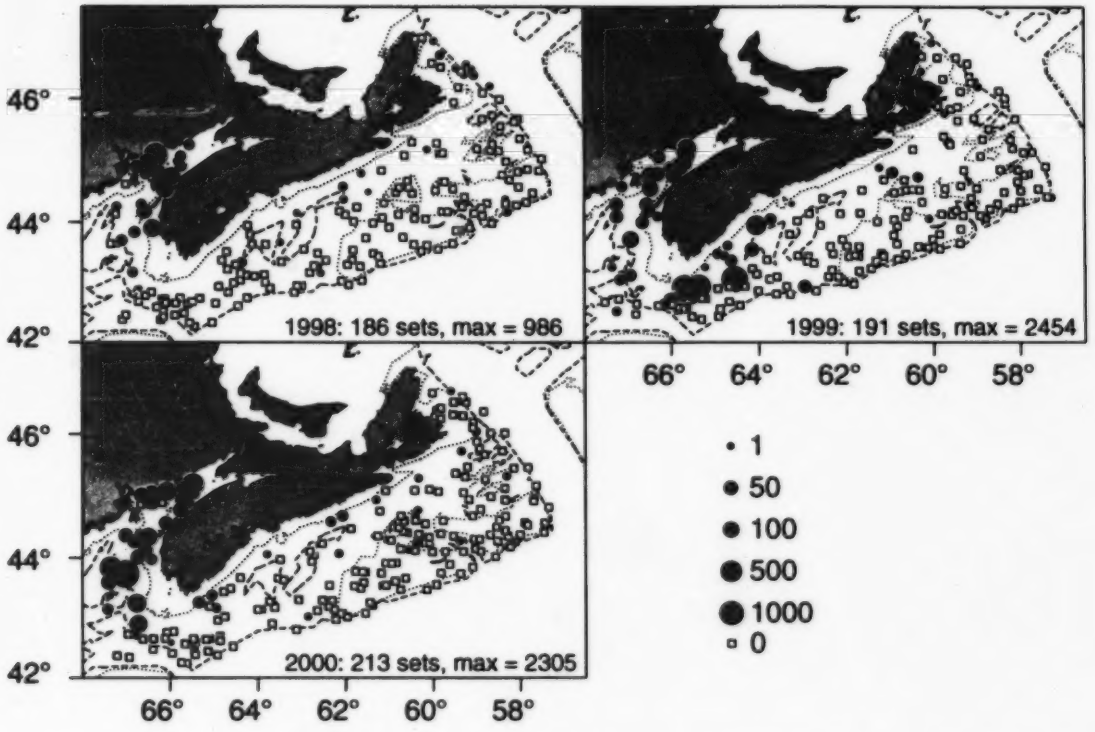

Fig. 111. 4VWX Spiny Dogfish Biomass (kg/tow) from the 1998-2000 Summer Groundfish Survey.

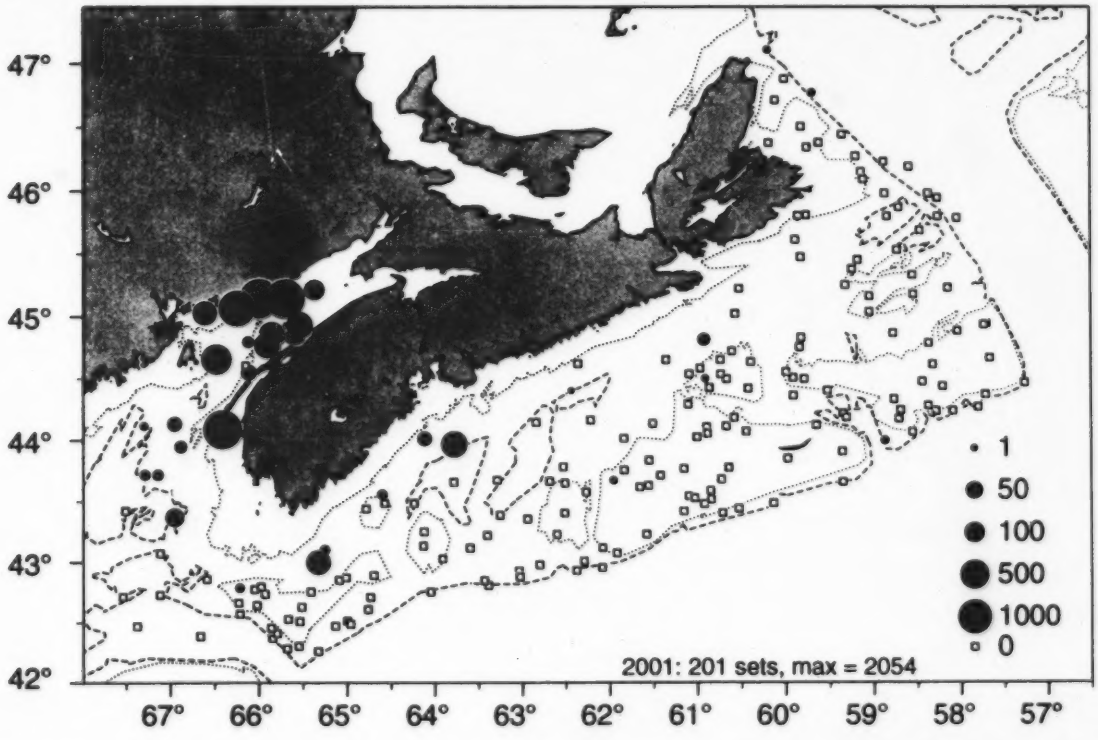

Fig. 112. 4VWX Spiny Dogfish Biomass (kg/tow) from the 2001 Summer Groundfish Survey.